MASS. MP03.2:R76/4

UMASS/AMHERST

312066004929830

Route 20 Corridor Planning Study

Long-Range Element

GOVERNMENT DOCUMENTS
COLLECTION
DEC 10 1991
University of Massachusetts
Depository Copy

A report produced by
the Central Transportation Planning Staff
for the Massachusetts Department of Public Works

913/105

Digitized by the Internet Archive
in 2014

https://archive.org/details/route20corridorp00pagi

Route 20 Corridor Planning Study
Long-Range Element

Authors
Efi Pagitsas - Project Manager
Michael J. Costa
Alicia Powell Wilson

Contributing Analysts
Russell Bond
Cecilia Ho
Linda Olson Pehlke

Graphics
Carol Gautreau Wilson
Jane M. Gillis
Barbara L. Clark

Word Processing
Olga Doherty
Patricia Keary

The preparation of this document was supported by the Massachusetts Department of Public Works and Federal Highway Administration through contracts 23892, 87183, 88007, 88671, 89001, 89098, and 89203, and through Interdepartmental Service Agreements 5617 and 5787.

Central Transportation Planning Staff
Directed by the Boston Metropolitan Planning Organization, which comprises:

Executive Office of Transportation and Construction, Commonwealth of Massachusetts
Massachusetts Bay Transportation Authority
Massachusetts Bay Transportation Authority Advisory Board
Massachusetts Department of Public Works
Massachusetts Port Authority
Metropolitan Area Planning Council

August 1991

Copies may be obtained from the State Transportation Library, Ten Park Plaza, 2nd floor, Boston, Massachusetts 02116

Abstract

This report documents the second part of a two-part corridor planning study of Route 20 in the towns of Weston, Wayland, Sudbury and Marlborough. A companion report, *Route 20 Corridor Planning Study: Short-Range Element*, was published in 1988. In the long-range element of this study, the impacts of 2010 population and employment on traffic in the corridor have been assessed. The highway alternatives analyzed, which are town-specific, were developed in cooperation with the MDPW, MetroWest and the towns' traffic committees. The alternatives, including no-build, were assessed through intersection level of service analysis and diversion analysis. Conclusions and recommendations based on the analysis results are included in this report.

Acknowledgments

The Route 20 corridor planning study took a number of years to complete, as work was frequently interrupted during both the short- and long-range elements to fulfill other client priorities. To mention only two examples, the Route 20 project team was called on to work on the Marlborough East and West studies, which used much information gathered for the Route 20 project.

Despite the lengthiness of the study, numerous individuals persevered in devoting an active interest to it, and helped keep it going. In particular, I wish to thank the following for contributing as advisors, analysts or authors, or in other ways: Mike Burke, Laurinda Bedingfield, Peter Donahue, Bob Shea, Matt Currie, Chuck Sterling, Al Laing, Don Molin, Bob MacDonald, Bob Patneaude and John Amato of the MDPW; Bob Sloane of EOTC; Doug Carnahan, Joan Blaustein and Patty Johnson of MAPC; Roz Delori of the MetroWest Transportation Task Force; the Weston, Wayland, Sudbury and Marlborough traffic committees; and my colleagues in the Traffic Analysis and Design group--Russ Bond, Barbara Clark, Mike Costa, Florence Ngai (now in the Transportation Systems Analysis Group), Linda Pehlke, Bill Steffens, Alicia Wilson and (no longer at CTPS) Ed Bromage, Cecilia Ho and Adam Ryssdal.

In addition, my sincere thanks for their dedicated efforts go to those involved in production: to Olga Doherty and Patricia Keary for meticulous word processing, to Carol Wilson, Jane Gillis and Ken Dumas for graphics, and to Lee Morrison for overseeing production.

Finally, I want to emphasize that the cooperative nature of the work of the MDPW's Bureau of Transportation Planning and Development, the town traffic committees, the MetroWest Transportation Task Force and the CTPS project team made the study process a truly integrated one, and that this was crucial to its being, I believe, a successful one.

Efi Pagitsas
Project Manager

Table of Contents

LIST OF FIGURES AND TABLES vii

EXECUTIVE SUMMARY xi

1 INTRODUCTION 1

1.1 Background 1

1.2 Study Description 2

1.3 Study Area Definition 2

2 EXISTING CONDITIONS 5

2.1 Highway Network 5

2.2 Socioeconomic Characteristics 5

2.3 Existing Public Transportation Services 8

2.4 Traffic Volumes 11

2.4.1 Traffic Volume Patterns 11
2.4.2 Adjustments and Balancing 12

2.5 Intersection Level-of-Service 17

2.5.1 Focus of Analysis 17
2.5.2 Definition of Level-of-Service 17
2.5.3 Analysis Results 20

3 FUTURE CONDITIONS 25

3.1 1995 Socioeconomic Characteristics 25

3.2 2010 Socioeconomic Characteristics 27

3.3 Travel Demand Forecasts 31

3.3.1 The Modeling Process 31
3.3.2 The Route 20 Traffic Forecasting Model 32

3.4 Alternatives 33

3.4.1 Development of Alternatives 33
3.4.2 Alternatives Analysis 35
3.4.3 Selection of Alternatives 46

3.5 Analysis of Selected Alternatives 49

3.5.1 Assignment Results - Selected Alternative 1 49
3.5.2 Assignment Results - Selected Alternative 2 49
3.5.3 Transit Service Options 49
3.5.4 Identification of Preferred Alternatives 57
3.5.5 Additional Weston Options 63

3.6 Intersection Level-of-Service 68

3.6.1 Analysis Results 68
3.6.2 Additional Analysis In Marlborough 94

4.0 CONCLUSIONS 97

5.0 RECOMMENDATIONS 101

APPENDICES

A Addendum to *Route 20 Corridor Planning Study: Short-Range Element*

B Automatic Traffic Recorder (ATR) Counts by Town

C Route 20 Right-of-Way and MDPW Roadway Inventory File

D Historical Information on Bus and Commuter Rail Service

E MDPW Chapter 30, Section 61, Findings for Developments Along Route 20

F • 1995 and 2010 Commercial and Residential Developments in the Study Area Towns
• 1987, 1995 and 2010 Socioeconomic Characteristics of Traffic Zones in Study Area Towns

G 2010 No-Build Assumptions

H • Presentation Announcements and Agendas
• Newspaper Clippings

I Comments on Draft Report and Responses

List of Figures and Tables

Figures

1-1	Route 20 Corridor Planning Study Area	4
2-1	Highway System in Study Area	6
2-2	AM Peak Period Traffic Volumes	15
2-3	PM Peak Period Traffic Volumes	16
2-4	1987 Peak Hour Traffic Volumes	18
3-1	Alternative 1, No-Build 2010 PM Peak Hour Traffic Volumes	37
3-2	Alternative 2, 4-Lane Route 20 2010 PM Peak Hour, Traffic Volume Changes from No-Build	39
3-3	Alternative 3, 4-Lane Route 20 (Marlborough) 2-Lane Route 20 (Sudbury through Weston) 2010 PM Peak Hour, Traffic Volume Changes from No-Build	40
3-4	Alternative 4A Segmented Option 1 2010 PM Peak Hour, Traffic Volume Changes from No-Build	42
3-5	Alternative 4B Segmented Option 2 2010 PM Peak Hour, Traffic Volume Changes from No-Build	44
3-6	Alternative 4C Segmented Option 3 2010 PM Peak Hour, Traffic Volume Changes from No-Build	45
3-7	Metrowest Transportation Task Force, Response to Long Range Alternatives	47
3-8	Selected Alternative 1, 2010 PM Peak Hour, Traffic Volume Changes from No-Build	50
3-9	Selected Alternative 2, 2010 PM Peak Hour, Traffic Volume Changes from No-Build	51
3-10	Metrowest Transportation Task Force, Response to November 20, 1990 CTPS Presentation	58

3-11	One-Way System in Weston	64
3-12	One-Way System Option in Weston PM Peak Hour Volumes	65
3-13	Restricted Left-Turn Option in Weston PM Peak Hour Volumes	66
3-14	2010 No-Build PM Peak Hour Volumes and Volume Changes with Restricted Left Turns in Weston	67
3-15	Weston Isolated Improvements Option	73
3-16	Weston Turning Movement Restrictions Option	74
3-17	Weston One-Way System Option	75
3-18	Wayland Route 20 at Old Connecticut Path Road Proposed Signal Operation	78
3-19	Wayland Route 20 at Routes 27/126 Proposed Signal Operation	81
3-20	Sudbury Route 20 at Concord Road Proposed Signal Operation	86
3-21	Sudbury Route 20 at Nobscot Road Extension Proposed Signal Operation	87
3-22	Sudbury Nobscot Road Extension Proposed Geometry	88
3-23	Sudbury Full By-Pass Proposed Geometry	89

Tables

2-1	1987 Socioeconomic Characteristics	7
2-2	1987 Traffic Volumes AM and PM Peak Periods by Hour and Direction	13
2-3	Distribution of 1987 Traffic Volumes, AM and PM Peak Periods	14
2-4	Signalized Intersection Level of Service Criteria	19
2-5	Unsignalized Intersection Level of Service Criteria	20
2-6	Weston 1987 Levels-of-Service	21
2-7	Wayland 1987 Levels-of-Service	22
2-8	Sudbury 1987 Levels-of-Service	23
2-9	Marlborough 1987 Levels-of-Service	24

3-1	1987 and 1995 Population and Households	26
3-2	1987 and 1995 Retail and Non-Retail Employment	28
3-3	1987 and 2010 Population and Households	29
3-4	1987 and 2010 Retail and Non-Retail Employment	30
3-5	Commuter Rail Boardings at the Fitchburg Line Study Area Stations	56
3-6	Weston 2010 Levels of Service	69
3-7	Weston 2010 Levels of Service Improvements Option	71
3-8	Weston 2010 Levels of Service Additional Improvements Option	72
3-9	Wayland 2010 Levels of Service	77
3-10	Wayland 2020 Levels of Service with Turning Movement Restrictions Option in Weston	80
3-11	Sudbury 2010 Levels of Service	83
3-12	Marlborough 2010 Levels of Service	90
3-13	Marlborough, Route 20 East 2010 Access Scenarios PM Peak Hour Level of Service	95

Executive Summary

BACKGROUND

The Route 20 Corridor Planning Study was initiated by the Massachusetts Department of Public Works (MDPW) to: assess and recommend potential short- and long-range improvements to the corridor from Interstate 95 (Route 128) to Interstate 495; provide an accurate assessment of existing and future conditions against which potential impacts of new development could be measured; and provide a comprehensive view of the corridor in response to a number of studies completed both by municipalities and by private entities which looked at particular segments of the corridor.

The Long-Range Element is the second volume of a two-phase study. The first volume, entitled Route 20 Corridor Planning Study: Short-Range Element, was published in October 1988. An addendum to that report with responses to towns' comments is contained in Appendix A of this report.

To ensure MDPW and town support for the identified alternatives, the following guidelines were adopted early on in the corridor planning process:

- Maintain the integrity of Route 20 as a facility serving regional and inter-town travel.
- Ensure that recommended improvements in one town cause no adverse traffic impacts in adjacent towns.
- Ensure that recommended improvements be sufficient to accommodate the projected land-use developments.
- Include recommendations for transportation modes other than the single-occupant vehicle.

STUDY AREA AND METHODOLOGY

The study area covered the towns included between Routes 117, 128, 135 and I-495. The primary study area included the towns of Weston, Wayland and Sudbury and the city of Marlborough.

The base year was 1987 and the horizon year 2010. The study forecast 2010 traffic volumes utilizing a traffic demand model developed specifically for that

purpose and calibrated to 1987 PM peak period traffic volumes. The effectiveness of the improvement scenarios was assessed in terms of diversion analysis and intersection level-of-service analysis.

ALTERNATIVES

Alternatives for final analysis were selected from a series of options based on analysis results and on the preferences of the MDPW and the participating communities. The following preferred alternatives were analyzed:

No-Build Alternative

The purpose of studying this option was to create a basis for comparison of the Build alternatives. Also, because it contains no major changes in the roadway network, its comparison with the 1987 base gives the "pure" effect of the changes in land use that are projected for the year 2010.

Between 1987 and 2010, PM peak period traffic grows by 20 to 50 percent. The higher growth occurs in the towns of Weston and Marlborough in the vicinity of Routes 128 and 495. The lower growth is observed in the towns of Wayland and Sudbury.

Analysis of the 2010 through/local mix of traffic along the corridor showed that 50 percent of the two-way Route 20 traffic at the Waltham/Weston town line travels through Weston; 26 percent of the two-way traffic at the Weston/Wayland town line travels through Wayland; 26 percent of the two-way traffic at the Sudbury/Wayland town line travels through Sudbury; and 5 percent of the two-way traffic at the Sudbury/Marlborough town line travels through Marlborough.

At the Sudbury/Wayland town line, a possible location for the establishment of a commuter park-and-ride facility, 60 percent of the total traffic represents exchanges between locations within the study area towns and the rest between study area locations and points along Route 128. The number of vehicle trips passing through this location with Boston destinations is very low. This could indicate that the majority of Marlborough and Sudbury traffic to Boston filters to the Massachusetts Turnpike through north-south facilities west of this location.

As in base 1987 conditions, the presence of north-south trips on Route 20 continues. There are probably numerous locations where this phenomenon occurs; however, the locations which stand out are at School Street, Wellesley Street and Old Boston Post Road in Weston, Old Connecticut Path in Wayland, and Nobscot and Union streets in Sudbury.

The intersection level-of-service analysis showed an increase in delay and queue lengths between 1987 and 2010. However, a number of locations, in particular

in Marlborough where improvements have been built or anticipated from development mitigation, showed marked improvements from 1987 conditions.

Preferred Build Alternatives

The purpose of these alternatives was to examine the effect of segmented Route 20 improvements at each of the four towns. The common features of the two options are: a four-lane Route 20 in Marlborough, a three-lane Route 20 in Weston east of Wellesley Street and a two-lane Route 20 in the rest of its length. The two alternatives differ in Sudbury, where the first includes the correction of the Nobscot/Union Street off-set while the second, in addition to that correction, includes the full bypass between Station Road and Horse Pond Road.

For both alternatives, analysis showed that the widening of Route 20 to four lanes in Marlborough causes Route 20 traffic increases from the No-Build case in Marlborough and just east of the Marlborough/Sudbury town line. These increases are from traffic which, under the 2010 No-Build case, would be on east/west roads in Marlborough and western Sudbury. Therefore, the shift of traffic to Route 20 would be beneficial to local roads. Intersection analysis in Marlborough showed that, with minor signal modifications at the time of the widening, the development mitigation and other committed improvements will allow the intersections to accommodate the additional traffic within acceptable levels-of-service.

The three-lane Route 20 in Weston also causes some traffic increase which, however, is limited to the widened segment only. About half of the additional traffic is caused by shifts in traffic movements within the town of Weston. The rest is traffic from points south of town.

Since the widenings in Marlborough and Weston do not affect the rest of Route 20, the level of service of the intersections in Weston and Wayland remains unchanged from the No-Build, in both alternatives. In Weston, the results of the level-of-service analysis showed that for both the No-Build and Build cases, the Route 20 approaches at School and Wellesley streets will require two through lanes. Another conclusion of the analysis was that a traffic signal is needed at Wellesley Street and exclusive northbound and southbound left turn lanes are needed at the School Street intersection. These improvements result in higher benefits than the two additional traffic circulation variations which are discussed later in this section, and would probably require the greatest amount of right-of-way takings.

In Wayland, at the intersection of Route 20 at Routes 27/126, the addition of a second general-purpose eastbound lane and the inclusion of a protected north/south phase in the signal design are the minimum modifications found necessary at this location. The construction of an exclusive right turn lane at the westbound approach would enhance even more the processing capacity of this intersection and would, in turn, allow for the introduction of a pedestrian phase for the safe crossing

of pedestrians and bicycles. However, even with this design, only a marginally acceptable overall level of service is expected.

At Pelham Island Road, the signal at Routes 27/126 will keep providing acceptable gaps for Pelham Island traffic to cross Route 20. However, the northeastern end of Pelham Island Road is expected during the peak hours to be blocked by southbound vehicles on Routes 27/126.

In Sudbury, the Nobscot Road extension is very beneficial to the Route 20/ Union Street intersection because of the reduction in the eastbound left turn volume in the evening (the right turn southbound volume in the morning). The conversion of the Nobscot Road intersection to a four-way one is a major benefit to this location and to the Route 20 segment between Nobscot Road and Union Street. The full bypass further improves this location by diverting a large portion of the Route 20 traffic, including the Raytheon traffic. The Nobscot extension is positively impacted by the Sudbury Route 20 bypass, to the point that this intersection is expected to function safely without a traffic signal.

Weston Variations of Build Alternatives

At the request of the Weston traffic committee, CTPS investigated two variations of the Preferred Build Alternatives. The purpose of these options was to improve traffic circulation in the area affected by traffic on School Street, Wellesley Street, the segment of Route 20 between them, and Old Boston Post Road between Route 20 and Church Street.

In the one-way circulation scheme, the level of service at all intersections is improved from the No-Build, but it is still only marginally acceptable at Wellesley and School streets. This option would probably require the least right-of-way acquisition, and it would require a change in the resident and general traffic travel patterns.

The left-turn restriction scheme also requires less right-of-way acquisition compared to the isolated improvements of the Build alternative. The level of service at the three Route 20 intersections analyzed is markedly improved over the No-Build and somewhat better than the Build alternative with isolated improvements. This option will change the travel patterns in Weston between Route 30 and Route 20. It will also increase traffic at Route 128 south of Route 20, Highland Street and Old Boston Post Road in Weston, and Old Connecticut Path in Wayland.

Transit Options

Analysis showed no evidence of a substantial increase in demand for commuter rail or express bus service in the towns along the corridor. Any small increases are anticipated to be served well by existing transit services. The principal factors influencing these determinations are that: (1) presently Route 20 is not used

primarily for trips to downtown Boston, but primarily serves traffic to/from Route 128 and intertown traffic; (2) the number of residents of corridor communities employed in downtown Boston is not expected to increase significantly; (3) highway travel times from corridor communities to Boston are not expected to increase in the future by as much as other corridor travel times in the region; (4) the Route 20 corridor is well served by two commuter rail lines, the Fitchburg and Framingham lines; (5) Riverside, served by MBTA express buses and the Green Line, and private company express buses in Framingham are within good access distance from Weston, most of Wayland and part of Sudbury; (6) a private local/express bus service already exists with a very low ridership record; (7) re-establishment of the discontinued commuter rail service from Sudbury, Wayland and Weston would be extremely costly.

However, the identification of a Route 20 location as a commuter park-and-ride facility could possibly benefit the existing bus riders to Boston or lead to the establishment of a new feeder bus service to Riverside.

The commuter traffic to Route 128 destinations is a very difficult market to serve because it is a "many-to-many" type of trip exchange. In addition, employee parking at businesses along Route 128 is free. The most efficient demand reduction measure for this type of market is the promotion of carpools and vanpools with employer initiatives.

RECOMMENDATIONS

Based on the analysis, the following recommendations can be made.

- The variety of land uses associated with the Route 20 corridor in each of the four communities and the different community goals and objectives for improving Route 20 dictate that future travel demand be accommodated with a number of segmented improvements at critical locations along the corridor. The improvements recommended below were designed to meet projected 2010 land-use demands and do not necessarily meet demand from additional growth.

- The construction of sidewalks, where appropriate, in conjunction with state highway projects is fully supported and recommended in all towns. After construction, sidewalk maintenance becomes a town responsibility through a memorandum of understanding (MOU) signed by the MDPW and the town.

- In **Marlborough**, the widening of Route 20 from Stevens Road to just west of the Marlborough/Sudbury town line is recommended. Because most of the intersections analyzed in Marlborough will be at a delicate demand/capacity balance, any traffic beyond that associated with projected 2010 land use will cause unacceptable levels-of-service.

- In **Sudbury**, the construction of the Nobscot Road extension is strongly recommended. The Sudbury Village bypass may deserve more study by the town in the future.

- In **Wayland**, the reconstruction of the Routes 20/126/27 intersection with the exclusive right turn lane and the pedestrian signal phase is strongly recommended. The design of this signal with traffic preemption features for the police and the fire department is also strongly recommended.

  For Pelham Island Road the following is recommended: traffic channelization should be implemented at the Route 20/Pelham Island Road intersection; the "DO NOT BLOCK INTERSECTION" sign facing the Routes 27/126 southbound traffic before the intersection of Routes 27/126 with Pelham Island and Millbrook roads should be kept visible at all times.

  The analysis at Old Connecticut Path showed that traffic signal control will be necessary by 2010. It is recommended that this location be monitored periodically and the signal installed only if it meets the necessary warrants.

  The establishment of a commuter park-and-ride lot is recommended. Its existence should be publicized to residents and bus operators. It is also recommended that the route and service schedule of the Big W bus be made known to the residents of the study-area towns and adjacent towns through a mailing.

- In **Weston**, it is recommended that Route 20 be marked as a three-lane facility east of Wellesley Street for the purpose of processing eastbound traffic faster in the morning.

  The restriction of left turns from the east and the west of Route 20 at School and Wellesley streets and the associated geometric design changes are not recommended, because they divert traffic to other local roads in Weston and roads of adjacent towns. Of particular importance are the expected diversions to Old Boston Post Road, for the benefit of which the present Route 20 Bypass was originally built. Instead, the isolated improvements at Highland, School and Wellesley streets with coordinated traffic control are recommended. The recommended geometric design includes three-lane Route 20 approaches at Wellesley, School and Highland streets, with exclusive left turn lanes.

1 Introduction

1.1 BACKGROUND

The Route 20 Corridor Planning Study was initiated by the Massachusetts Department of Public Works (MDPW) in 1985. The purpose of the study was threefold: to assess and recommend potential short- and long-range improvements to the corridor from Interstate 95 (Route 128) to Interstate 495; to provide an accurate assessment of existing and future conditions against which potential impacts of new development can be measured, and to provide a comprehensive view of the corridor in response to a number of studies recently completed by both municipalities and private entities which looked at particular segments of the corridor.

This report is the second volume of a two-phase study. The first volume, entitled Route 20 Corridor Planning Study: Short-Range Element, was published in October 1988. It contained a description of existing traffic conditions at intersections along the corridor and recommended low-budget intersection improvements which could be implemented in a short period of time. The technical name for this type of improvement is transportation systems management (TSM) measures. Typically, these consist of improvements which can be accomplished within the existing pavement width and may include traffic signals, signal phase alterations, new signal timings and pavement-marking alterations to allow for changes in traffic-lane use.

The completion of the short-range report concluded a lengthy process of data collection, field visits, technical analyses, and meetings with the MDPW. In addition, numerous presentations detailing the short-range study's findings and recommendations were made to the MetroWest Transportation Task Force and representatives of the traffic committees of the towns of Weston, Wayland and Sudbury and the city of Marlborough. The roles taken by CTPS in both the short- and long-range elements of the Route 20 study were those of technical adviser to the MDPW and liaison between the state transportation agencies and the towns. Through meetings with the MDPW and community representatives, several guidelines to be applied in the development of potential improvement alternatives were identified. These guidelines are described below:

- The integrity of the road as a facility serving regional and inter-town travel should be maintained. Historically, Route 20 was built for long distance travel between Boston and Worcester, and beyond. However, since the construction of the Massachusetts Turnpike and Route 128, the roadway functions as a

subregional, inter-town facility. Continuation of this role is important because it contributes to the economic vitality of the towns and keeps congestion off of local residential streets.

- Improvements recommended in one town should cause no adverse traffic impacts in adjacent towns. For example, in the early stages of the corridor planning work, the city of Marlborough had conducted a study which recommended the widening of Route 20 in East Marlborough to four lanes. Therefore, one of the tasks of the study became to assess the potential impacts of this improvement option on the other study area towns. In addition, improvement alternatives and their potential impacts were discussed with each affected community and the MetroWest Transportation Task Force.

- Finally, recommended improvement alternatives should be sufficient to accommodate projected land-use development levels and the possible use of transportation modes other than the single-occupant vehicle.

1.2 STUDY DESCRIPTION

The purpose of the long-range element of the study was to assess projected traffic conditions on Route 20 and other roadways in the study area and to identify improvement alternatives designed to correct anticipated deficiencies. The analysis years for existing and future conditions were 1987 and 2010. Traffic volumes for 2010 were forecast utilizing a transportation travel demand model developed for the study. The effectiveness of the improvement alternatives was assessed in terms of diversion analysis and intersection level-of-service analysis. Finally, recommended alternatives were selected based on analysis results and the preferences of the MDPW and the towns.[1]

1.3 STUDY AREA DEFINITION

The study area covered the towns of Weston, Wayland, Sudbury, Wellesley, Natick, Framingham, Southborough, and Hudson, portions of Stow and Maynard, and the city of Marlborough. Such an extensive coverage was necessary in order to include roads such as the Massachusetts Turnpike, Route 9, Route 16 and Route 30, which may serve as traffic diversion routes from the Route 20 corridor.

Locations at the boundary of the study area where traffic enters and exits are defined as external zones. An area of influence for each external zone is defined as the area from which traffic utilizing that particular facility is drawn. For example, the area of influence for the external station at Route 20 east of Route 128 included Waltham, Watertown and Belmont. For forecasting purposes, socioeconomic

---

[1]For purposes of convenience, any reference to "the towns" includes, in addition to the towns of Weston, Wayland, and Sudbury, the city of Marlborough.

changes in the area of influence are assessed to predict changes in the volumes entering and exiting the study area at each external zone.

Figure 1-1 shows the study area.

FIGURE 1-1
Route 20 Corridor Planning Study
Study Area

2 Existing Conditions

2.1 HIGHWAY NETWORK

Figure 2-1 presents a map of the state highway system within the Route 20 study area. The segment of the Route 20 corridor included in this study is bounded by Route 128 to the east and Route I-495 to the west. Both Route 128 and Route I-495 are included in the study network. Between Route 128 and I-495 there are three north-south state routes crossing the corridor, Route 126, Route 27 and Route 85. Parallel to Route 20 are Routes 117 and 62 to the north and Route 30, Route I-90 (Massachusetts Turnpike), Route 9 and Route 135 to the south. All of these roads play an important role in Route 20 travel and were necessarily included in the study. Route 128 and I-495 are utilized to carry many of the study area residents to workplaces. Route I-90 carries a large number of trips from the study area to Boston, Cambridge, Brookline and other workplace locations inside Route 128. Route 30 is used by town residents for intratown trips as well as for access to Routes 128 and I-90. Routes 117 and 62 carry resident and other traffic to Route 2 and, indirectly, to Route 128. Route 20 is accessed by town residents via the north-south state roads or local roads which feed/distribute traffic to Route 20 or simply cross it to reach other major roads.

2.2 SOCIOECONOMIC CHARACTERISTICS

For travel demand modeling purposes the study area was divided into 247 small areas called traffic analysis zones. (For further discussion of traffic zones and the modeling process in general see Section 3.3.1) In order to determine the number of trips that are generated within the study area and distributed to the highway network, it is necessary to estimate the number of households and, retail and nonretail employees for each of the traffic zones in the study area. A number of sources were used to estimate these data for the 1987 base year. Among them are: U.S. Census Bureau population and household data; the Massachusetts Department of Employment Training (DET) employment data; assessor's maps, air photos; United States Geological Survey (USGS) maps; and information from various town planners.

The 1987 DET employment figures at the town level were used as control totals for each town in the study area. Employment at the traffic zone level in Weston, Wayland, and Sudbury was estimated by identifying each parcel in the zone

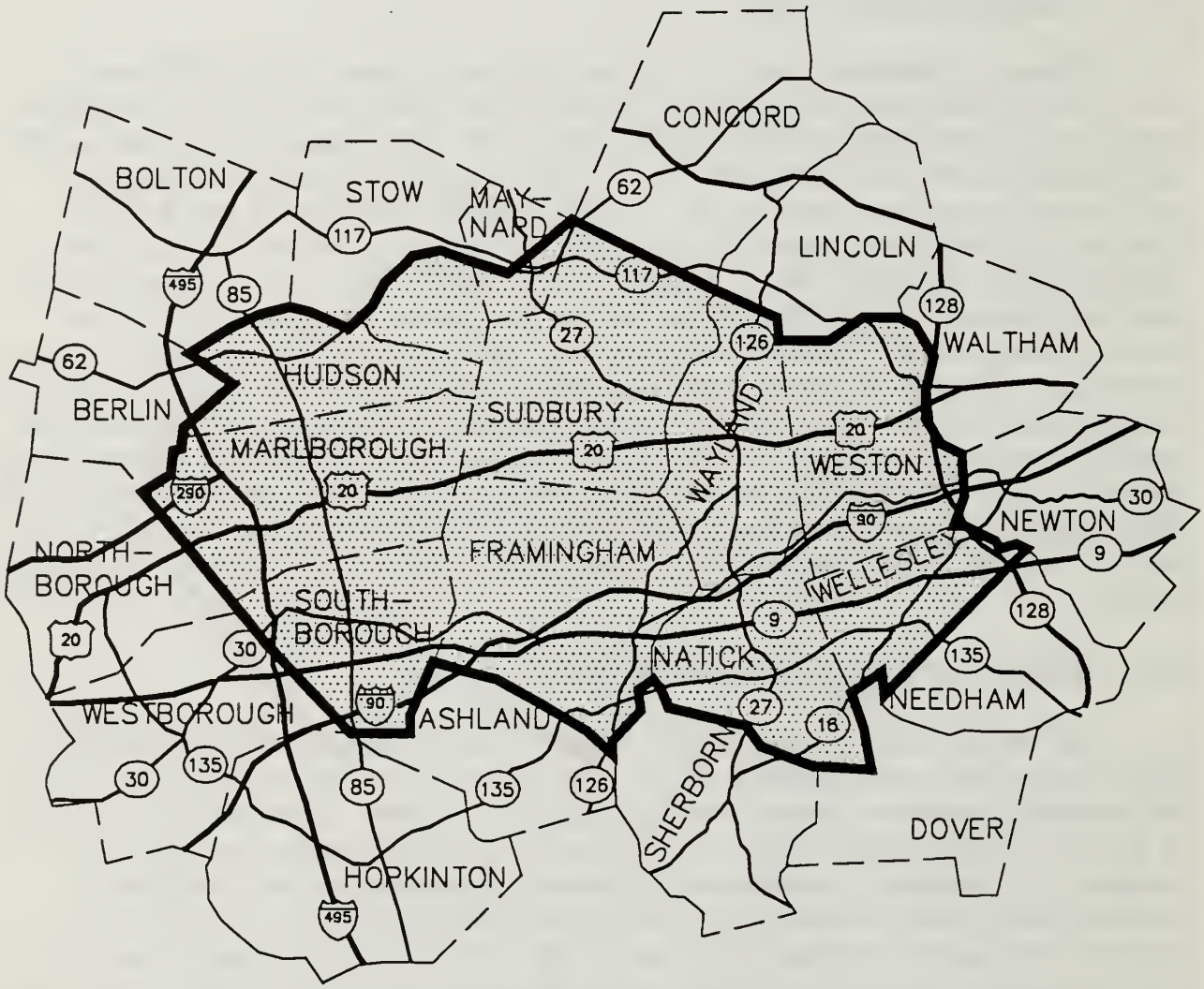


FIGURE 2-1
Highway System in Study Area

(assessor's maps and aerial photos) and determining the land use and square footage. Vacant square footage was estimated for leased office and industrial space (The Spaulding and Slye Report, April 1988) and subtracted from the total. Building square footage was converted to retail and non-retail employment on a parcel-by-parcel basis by applying the ITE Common Land Use Density[1] figures. (See Appendix F for a list of trip generation factors used.) The individual parcel employment was then summed to yield total employment for each zone. Zonal employment was summed to the town level and compared with the DET town total figures. If the two did not compare favorably, the estimated zonal numbers were adjusted to comply with the DET numbers. For Marlborough, the city planner submitted a list of retail and non-retail uses by zone. Employment was determined by using the procedure described above.

Households were distributed to the zones by counting houses from the aerial photographs, and/or by distributing the town total household count based on the location and density of residential areas.

The breakdown of households and retail and non-retail employment by town is presented below:

TABLE 2-1
1987 Socioeconomic Characteristics

Community	Households	Retail Employment	Non-Retail Employment
Marlborough	11,746	2,169	15,526
Sudbury	4,562	1,891	7,898
Wayland	4,206	1,195	2,125
Weston	4,060	413	3,189
Total	24,574	5,688	28,738

A listing of the number of households, retail and non-retail employees, and average 1980 household income assigned to each traffic zone can be found in Appendix F of this report.

[1]ITE Trip Generation Handbook, 4th Edition.

2.3 EXISTING PUBLIC TRANSPORTATION SERVICES

This section provides a description of the various public transportation services currently operating service from or through the study area communities to Boston.

The Big W Post Road Line

In 1985 this service was taken over from King's Transport. The history and operation schedules of Big W and all previous services are included in Appendix D.

The company operates one round trip per day. The bus starts in Northborough and stops at two locations in Marlborough before continuing into Sudbury, Wayland and Weston. The rest of the trip to Boston is express via Route 128 and the Massachusetts Turnpike. In Boston, the bus stops at Copley Square, Park Plaza Square, South Station and Government Center. The one-way fare varies between $2.65 and $4.15, depending on the origin and destination of the trip. A commuter ticket for eleven trips includes one free trip. Travel time between Northborough and Copley Square is 60 minutes. Travel time between Friendly's Restaurant in Sudbury and Copley Square is 35 minutes. Big W's riders on this line park at lots near the bus stops where they are picked up.

The ridership ranges from 10 to 20 commuters per direction.[2] During the entire month of August 1990 the bus carried a total of 584 commuters in both directions, or an average of 13 commuters per day per direction.[3]

This service is subsidized by the Massachusetts Bay Transportation Authority (MBTA) through its Inter-District Transportation Service Program (formerly Experimental Subsidies Program). The subsidy pays over 50 percent of the daily operating costs of the service.

Big W is also under a seven year bus lease contract with The Executive Office of Transportation and Construction (EOTC) under the agency's Intercity Bus Capital Assistance Program (IBCAP). Under this program EOTC buys buses and leases them to transit providers, seeking recovery of the capital expenditure only. Big W's lease is approximately $800 per month.[4]

---

[2]Telephone conversation with the owner of Big W.

[3]Telephone conversation with MBTA officer from the Inter-District Transportation Program.

[4]Telephone conversation with EOTC officer from the IBCAP.

The Gulbankian Bus Line[5]

This company provides service with three round trips each weekday (two of them during each peak hour) between Hudson, Marlborough, Southborough and Boston along Routes 85, 9 and I-90. Scheduled travel time to Boston is 60 minutes from Marlborough and 50 minutes from Southborough. The weekday ridership is 20 inbound commuters. The Gulbankian service is not subsidized.

The Peter Pan Express Bus to Boston

Peter Pan buses from Worcester transport passengers who park at the Shoppers World parking lot in Framingham and continue express to Boston. Between 6:30 and 9:30 AM there are 11 trips to Boston, Monday through Friday, with 15 minute headway. The travel time from the Shoppers World commuter lot to Copley Square (first stop in Boston) is 35 minutes. Parking at Shoppers World is free.

In 1988, the peak period ridership was about 300 per day in the morning and 250 in the afternoon.[6] There is no town-of-origin information for the passengers of Peter Pan. However, it is very likely that from the study area, south Wayland and south Sudbury residents constitute a significant part of its ridership.

Commuter Rail Service

Since the Central Massachusetts Branch of the MBTA (see Appendix D for the history of this service) was discontinued in 1971, Sudbury, Wayland and Weston commuters have had the option of taking the Fitchburg commuter rail line to North Station or the Framingham line to South Station in Boston. The Fitchburg line appears more attractive to north Sudbury, north Wayland and Weston residents while the Framingham line appears to be convenient to south Sudbury and south Wayland residents.

Both lines run four round trip trains during each peak commuting period every business day. Travel times to Boston from Fitchburg line stations convenient to Sudbury, Wayland and Weston residents (West Concord, Concord, Lincoln, Hastings and Kendall Green) range from 28 to 44 minutes, depending on the station of boarding. Travel times from the West Natick and Natick stations of the Framingham line range between 36 and 46 minutes, depending on the station and

---

[5]Information on this carrier was taken from the MBTA's "Commuter Rail Feasibility Study, Framingham to Worcester, Milford and Marlborough", Final Report, January 1990.

[6]From information Peter Pan provided to EOTC, December 6, 1988.

the run.[7] Parking at stations convenient to the four study area towns ranges between 50 and 260 spaces. However, commuters at some of the stations have difficulty finding parking space. In addition, since the spring of 1989, MBTA has imposed a parking fee of $1 per day at most station parking lots.

The latest existing information on station boardings by town of origin is from 1968. That survey showed that inbound boardings at all commuter rail stations, including the Central Mass. branch stations but excluding West Natick and Natick, were: 42 from Sudbury, 57 from Wayland and 91 from Weston. From the 1980 U.S. Census Journey-to-Work data, the corresponding ridership was: 50 from Sudbury, 22 from Wayland and 74 from Weston. While the drop in Wayland and Weston commuters could be attributed to the discontinuance of the Central Mass. branch in 1971, the total ridership from the three towns has been stable to around 150-200 commuters for over twenty years.

Express Bus at Riverside

The express bus from the Riverside Green Line station and parking lot, also known as Route 300 of the MBTA, leaves for Boston, on the average, every 8 minutes between 6:15 and 9:15 AM. In the evening it operates between 2:30 and 7:00 PM with the same frequency. The bus runs express to Boston on the Turnpike with a few stops downtown. The travel time between Riverside and Kneeland Street (first stop in Downtown Boston) is 24 minutes.

The one-way fare is $1.90 and the monthly commuter pass costs $61. Since Spring 1989 the MBTA has been charging a $2.00 parking fee for the day at its 1128 space lot. The Riverside express bus terminal, located at the interchange of the Massachusetts Turnpike and Route 128, has excellent automobile access for park-and-ride and pick-up/drop-off service.

In 1986, the total weekday ridership of the bus was 1610 commuters, 930 inbound to Boston and 680 outbound to Riverside.[8] The difference is due to the lower outbound fare on the Green Line, which encourages many morning express bus riders to return on the Green Line in the evening.

The Passenger Survey for the express bus Route 300 conducted in 1986 (see Appendix D for the results of the Survey) showed that of all riders, 182 (11.9 percent) live in Weston; 108 (7.1 percent) are Wayland residents; and 73 commuters (4.8 percent) originate in Sudbury. Comparison of the 1986 origin distribution to a CTPS

---

[7]The first and last peak period trains do not stop at Auburndale and West Newton.

[8]"West Corridor Bus Service Study", April 1990, produced by CTPS for the Massachusetts Bay Transportation Authority.

1978 Passenger Survey at Riverside[9] indicated practically the same distribution: out of 968 boardings between 7:00 and 10:00 AM, 12 percent were from Weston, 6.8 percent were from Wayland and 3.5 from Sudbury.

The Riverside Branch of the Green Line

The latest information on ridership at the Riverside terminal of the Green Line is from 1985.[10] On an average weekday, a total of 1544 commuters boarded at Riverside, 612 between 7:00 and 10:00 AM. The most recent passenger origination data available is from the CTPS 1978 Passenger Survey which shows that of the 400 inbound riders at Riverside during the same period in the morning, 11.5 percent were Weston residents, 3.4 percent were from Wayland and 1.4 percent were from Sudbury.

Riverside trains run every 6 minutes in the peak periods. The fare is $1.75 inbound and $0.75 outbound for trips to downtown Boston. The cost for parking is $2.00.

2.4 TRAFFIC VOLUMES

In order to establish existing conditions on the area's roadway network and to calibrate the traffic model, CTPS gathered a variety of traffic count data. In October 1987 the MDPW collected 48-hour directional counts at 18 count stations along the corridor and of all the ramps of the Route 128/Route 20 interchange. These counts were supplemented with intersection turning movement counts from the Route 20 Corridor Planning Study: Short Range Element and counts from environmental impact reports and other traffic studies. Any counts collected before 1987 were adjusted based on the growth reflected in the 1987 data.

Another source of traffic count data was the Howard Needles Tammen & Bergdorf traffic counts collected in 1987 for the Turnpike EIR. These counts were primarily at locations south of Route 20, along Route 9 and Route 135 and they had been collected during the periods 7-10 AM and 3-6 PM.

2.4.1 Traffic Volume Patterns

All 1987 MDPW counts were summarized to determine the directionality of the traffic volumes and, the AM and PM peak periods and hours. From this analysis it was determined that the peak periods of the day were 7-10 AM and 3-6 PM. Peak hours vary by direction and proximity of the location to employment centers or north/south roads, in particular Route 128 and I-495. At most Route 20 locations

---

[9]"Riverside Transportation Improvements Study", August 1978, prepared by CTPS.

[10]CTPS 1985 Surface Green Line Passenger Count.

the morning peak hour was 7-8 AM in the eastbound direction and 5-6 PM in the westbound direction. A summary of the 1987 counts along Route 20 and the hourly distribution within the peak periods is presented in Tables 2-2 and 2-3. Figures 2-2 and 2-3 show the morning and evening peak period volumes plotted by location along the corridor.

The AM plot (Figure 2-2) shows that, in general, eastbound volumes are higher. The exceptions are at three locations where the directional volumes are about equal and in two cases where the westbound is higher.

The three locations where directional volumes are nearly equal include: west of Nobscot Road, which reflects the effect of Raytheon in Sudbury, with its two driveways just west of the count location; the count east of Route 126/27 which also reflects the attraction of Raytheon in the northwestern quadrant of the intersection and the count at the Wayland/Weston town line shows the effect of Old Connecticut Path where north/south traffic uses Route 20 as part of the trip.

In Marlborough, westbound volumes are higher than eastbound volumes east of Curtis Street and east of Route 85 because of the attraction of Route I-495. However, just east of I-495 the peak direction reverses to eastbound because of the traffic passing through this location from I-495 with destinations to employment centers on Forest Street.

In the PM peak hour, the peak direction is generally westbound, but the directional split is less pronounced than in the AM. This reflects a time-flexibility in work-to-home trips as well as presence of shopping trips in the mix of traffic. An example of this phenomenon is the high total PM peak hour traffic east of Curtis Street in Marlborough where there is considerable retail activity.

The analysis shows that Route 20 serves two distinct functions within the four towns. In Weston and Marlborough, Route 20 serves mostly commuter traffic with characteristically high peak hour volumes and sharp directional splits. However, in the towns of Wayland and Sudbury the directional split is not as significant. This indicates the presence of local and general traffic, especially shopping trips in the evening. In a number of locations the absence of a pronounced directional split is caused by local traffic generators, like the Raytheon establishments in Wayland and Sudbury. The high overall volume also indicates that in addition to serving east-west traffic, Route 20 serves north-south traffic. An example is the Union Street to Route 20 to Nobscot Road pattern in Sudbury.

2.4.2 Adjustments and Balancing

Before utilizing raw traffic counts for analysis purposes, it is necessary to adjust the volumes for the effects of variations caused by the particular conditions under which the count was taken, such as day of the week or season of the year.

Eastbound

Location	AM 7-8	AM 8-9	AM 9-10	AM Peak Period	PM 3-4	PM 4-5	PM 5-6	PM Peak Period
Marlborough								
Rt. 20 @ Marl./North. T/L	829	823	385	2037	431	394	398	1223
Rt. 20 @ Felton St./I-495	840	760	660	2260	1313	1549	1843	4705
Rt. 20 E. of I-495	1274	1502	795	3571	844	931	979	2754
Rt. 20 E. of Rt. 85	481	402	357	1240	519	587	715	1821
Rt. 20 E. of Curtis St.	919	813	799	2531	881	1042	1196	3119
Rt. 20 W. of Wilson St.	855	804	627	2286	651	656	676	1983
Rt. 20 W. of Wayside Inn Rd.	943	789	437	2169	476	615	625	1716
Sudbury								
Rt. 20 E. of Peakham Rd.	1048	966	504	2518	604	598	679	1881
Rt. 20 W. of Nobscott Rd.	855	752	585	2192	827	926	969	2722
Rt. 20 E. of Concord Rd.	1114	978	722	2814	830	1065	1048	2943
Rt. 20 E. of Old Colony Rd.	1314	877	589	2780	713	915	837	2465
Wayland								
Rt. 20 E. of Rt. 126/27	1073	822	611	2506	770	881	841	2492
Rt. 20 @ Wayland/Weston T/L	1633	1298	850	3781	901	994	987	2882
Weston								
Rt. 20 W. of Rt. 128	1615	1775	1089	4479	1131	1127	1212	3470
Rt. 20 E. of Rt. 128	1564	1596	1076	4236	1319	1437	1587	4343

Westbound

Location	AM 7-8	AM 8-9	AM 9-10	AM Peak Period	PM 3-4	PM 4-5	PM 5-6	PM Peak Period
Marlborough								
Rt. 20 @ Marl./North. T/L	258	270	221	749	481	608	825	1914
Rt. 20 @ Felton St./I-495	1528	1678	940	4146	945	1004	1205	3154
Rt. 20 E. of I-495	980	1009	660	2649	982	1361	1474	3817
Rt. 20 E. of Rt. 85	763	734	482	1979	598	674	725	1997
Rt. 20 E. of Curtis St.	1028	944	813	2785	1144	1260	1234	3638
Rt. 20 W. of Wilson St.	534	589	561	1684	997	1183	1174	3354
Rt. 20 W. of Wayside Inn Rd.	517	484	397	1398	680	846	813	2339
Sudbury								
Rt. 20 E. of Peakham Rd.	494	467	443	1404	697	899	894	2490
Rt. 20 W. of Nobscott Rd.	727	763	587	2077	826	918	940	2684
Rt. 20 E. of Concord Rd.	632	699	589	1920	811	887	797	2495
Rt. 20 E. of Old Colony Rd.	515	537	555	1607	764	1079	895	2738
Wayland								
Rt. 20 E. of Rt. 126/27	898	781	652	2331	725	940	974	2639
Rt. 20 @ Wayland/Weston T/L	1732	1364	829	3925	1171	1352	1527	4050
Weston								
Rt. 20 W. of Rt. 128	1176	1009	710	2895	999	1258	1493	3750
Rt. 20 E. of Rt. 128	1455	1333	891	3679	1377	1578	1651	4606

Source: 1987 automatic traffic counts by the MDPW.

TABLE 2-2
1987 Traffic Volumes,
AM and PM Peak Periods by Hour and Direction

Eastbound

Location	AM Peak Period 7-8	8-9	9-10	PM Peak Period 3-4	4-5	5-6
Marlborough						
Rt. 20 @ Marl./North. T/L	41	40	19	35	32	33
Rt. 20 @ Felton St./I-495	37	34	29	28	33	39
Rt. 20 E. of I-495	36	42	22	31	34	36
Rt. 20 E. of Rt. 85	39	32	29	29	32	39
Rt. 20 E. of Curtis St.	36	32	32	28	33	38
Rt. 20 W. of Wilson St.	37	35	27	33	33	34
Rt. 20 W. of Wayside Inn Rd.	43	37	20	28	36	36
Sudbury						
Rt. 20 E. of Peakham Rd.	42	38	20	32	32	36
Rt. 20 W. of Nobscott Rd.	39	34	27	30	34	36
Rt. 20 E. of Concord Rd.	40	35	26	28	36	36
Rt. 20 E. of Old Colony Rd.	47	32	21	29	37	34
Wayland						
Rt. 20 E. of Rt. 126/27	43	33	24	31	35	34
Rt. 20 @ Wayland/Weston T/L	43	34	22	31	34	34
Weston						
Rt. 20 W. of Rt. 128	36	40	24	33	32	35
Rt. 20 E. of Rt. 128	37	38	25	30	33	37

Westbound

Location	AM Peak Period 7-8	8-9	9-10	PM Peak Period 3-4	4-5	5-6
Marlborough						
Rt. 20 @ Marl./North. T/L	34	36	30	25	32	43
Rt. 20 @ Felton St./I-495	37	40	23	30	32	38
Rt. 20 E. of I-495	37	38	25	26	36	39
Rt. 20 E. of Rt. 85	39	37	24	30	34	36
Rt. 20 E. of Curtis St.	37	23	29	31	35	34
Rt. 20 W. of Wilson St.	32	35	33	30	35	35
Rt. 20 W. of Wayside Inn Rd.	37	35	28	29	36	35
Sudbury						
Rt. 20 E. of Peakham Rd.	35	33	32	28	36	36
Rt. 20 W. of Nobscott Rd.	35	37	28	31	34	35
Rt. 20 E. of Concord Rd.	33	36	31	33	36	32
Rt. 20 E. of Old Colony Rd.	32	33	35	28	39	33
Wayland						
Rt. 20 E. of Rt. 126/27	39	34	28	27	36	37
Rt. 20 @ Wayland/Weston T/L	44	35	21	29	33	38
Weston						
Rt. 20 W. of Rt. 128	41	35	25	27	34	40
Rt. 20 E. of Rt. 128	40	36	24	30	34	36

Source: 1987 automatic traffic counts by the MDPW.

TABLE 2-3
Distribution of 1987 Traffic Volumes, AM and PM Peak Periods

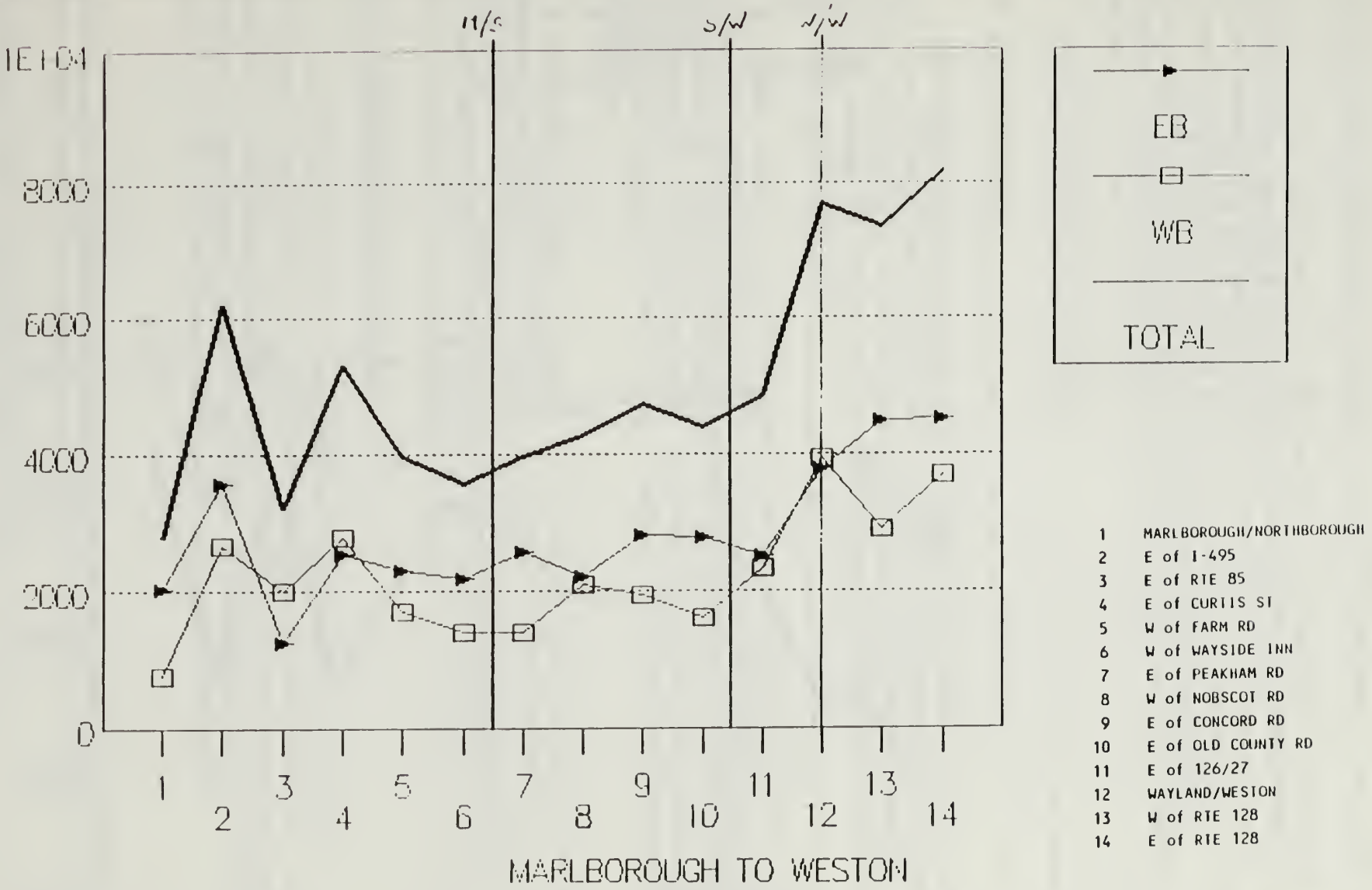


FIGURE 2-2
AM Peak Period Traffic Volumes

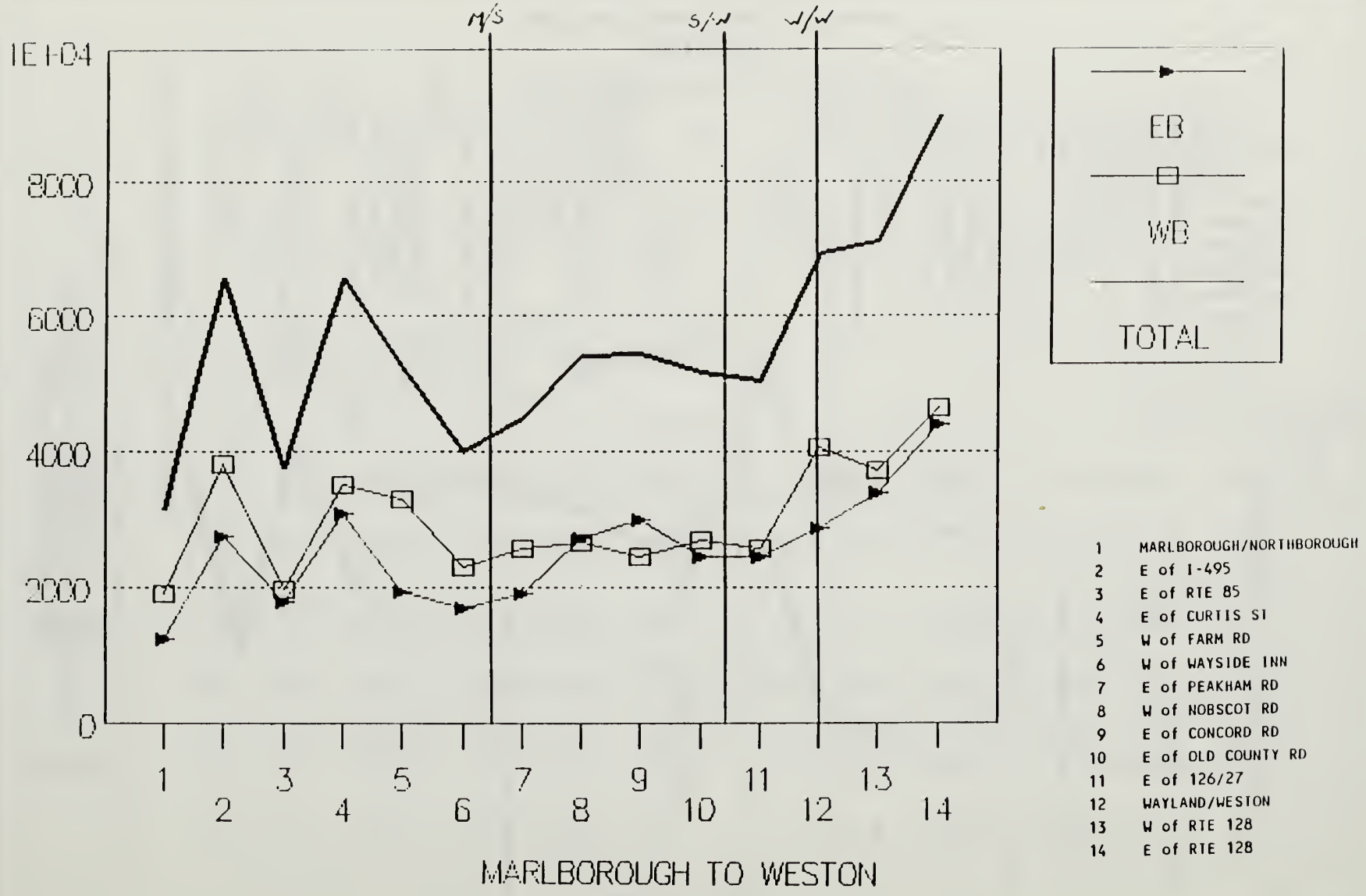


FIGURE 2-3
PM Peak Period Traffic Volumes

These adjustments were made using data from MDPW permanent count stations.[11]

After these effects had been accounted for, it was necessary to ensure that volumes entering an adjacent intersection are consistent with those leaving the previous intersection. Differences occur between adjacent intersections for a number of reasons such as counting errors or the effects of vehicles entering and leaving mid-block. The process of "smoothing" these differences is called "balancing." A selected sample of the resulting 1987, peak hour traffic volumes along the corridor are shown in Figure 2-4.

2.5 LEVEL OF SERVICE ANALYSIS

2.5.1 Focus of Analysis

The ability of intersections to safely and adequately process a given volume of traffic is one of the primary components in evaluating the operation of any roadway corridor. The quality of traffic flow along a corridor is impacted principally by conflicting turning movements, and the resulting speed changes and delays that are encountered at these locations.

Similar to most types of continuous systems, individual intersection points must be able to provide sufficient capacity to process the throughput demand of an entire system. In theory, this through demand can be regulated by the capacity of the individual paths or roadway segments. However, constraints at the intersection points will block or restrict the potential capacity of these paths and therefore of the entire system.

Because of their direct influence on the roadway network, the focus of the operational analysis found in this study is on the individual intersections along the Route 20 corridor. In Chapter 3, Future Conditions, improvement options are recommended at several of these locations so that each will provide sufficient capacity to process the existing and future traffic volume demands of this corridor.

2.5.2 Definition of Level of Service

Level of service (LOS) is the qualitative method used to measure the effectiveness of traffic flow and a motorist's perception of those conditions. As described in the Highway Capacity Manual[12] "a level of service definition generally describes the conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety."

---

[11]Station Route 20 at Wayland/Weston town line was used for Route 20 counts; station Route 9 at Pennsylvania Central R.R. was used for counts along Route 9

[12]Transportation Research Board, Special Report 209, 1985.

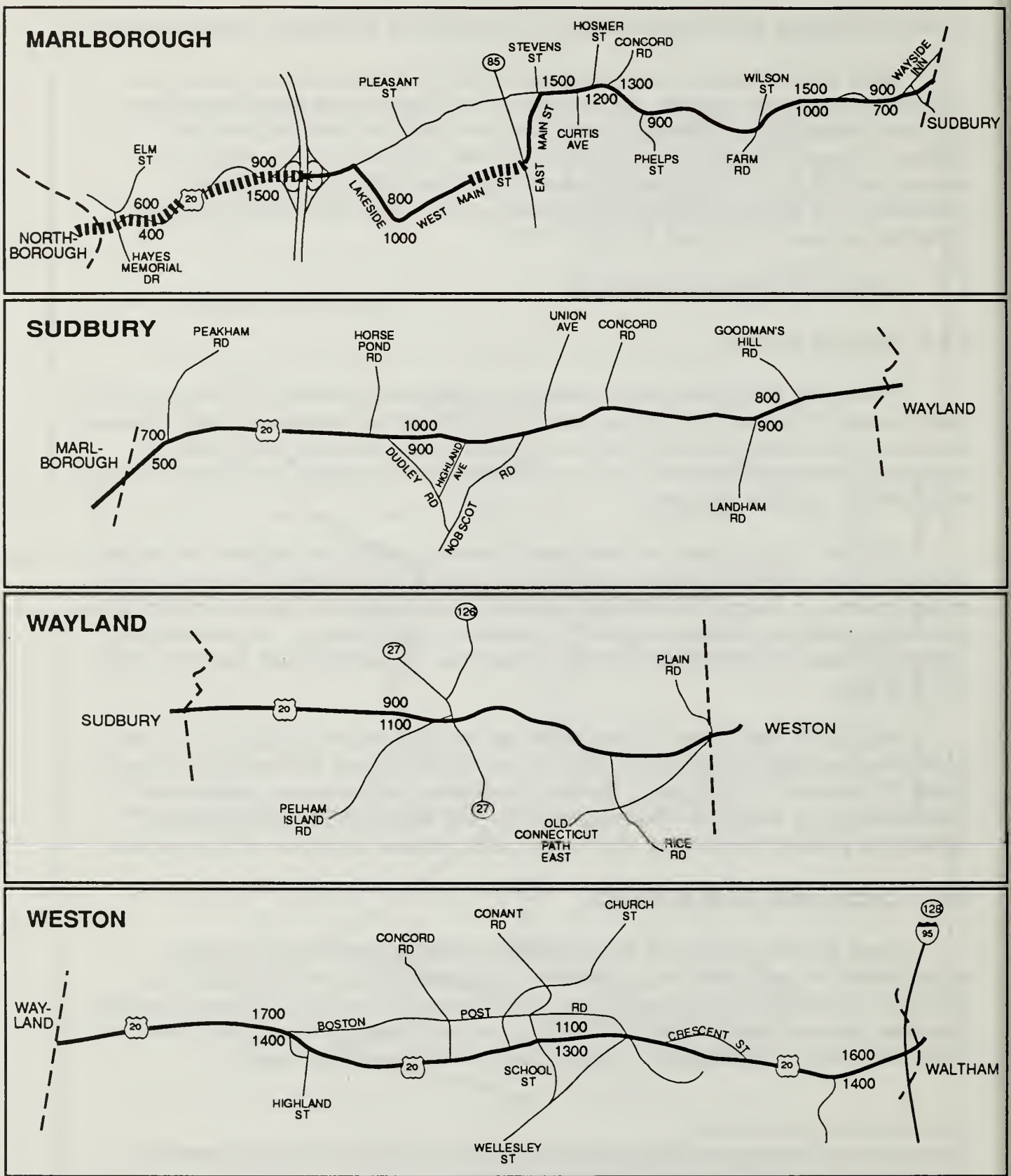


FIGURE 2-4
1987 PM Peak Hour Traffic Volumes

The major concept of the method used to analyze signalized intersections is delay. Delay is defined as a measure of driver discomfort, frustration, fuel consumption and lost time. Average stopped delay per vehicle is used as the criteria for signalized intersection level of service as shown in Table 2-4.

An index of letters from "A" to "F" is used to define performance levels, where "A" is the best and "F" is the worst. A level of service "A" is used to describe operating conditions with very low delay per average vehicle through an intersection. An "F" is used to describe an intersection with the average delay per vehicle in excess of 60 seconds. This condition is considered unacceptable by most drivers.

TABLE 2-4
Signalized Intersection
Level of Service Criteria

LOS	Stopped Delay per (Vehicle (seconds)
A	< 5.0
B	5.1 to 15.0
C	15.1 to 25.0
D	25.1 to 40.0
E	40.1 to 60.0
F	> 60.0

Source: Highway Capacity Manual (Transportation Research Board, Special Report 209, 1985)

For unsignalized intersections, the level of service is a function of the availability of acceptable gaps for the vehicles on the minor approach when merging with the major traffic approach. This function is quantified as reserve capacity for the minor approach measured in passenger cars per hour. As in signalized intersection analysis, an index from "A" to "F" is used as shown in Table 2-5.

For a comparison of unsignalized and signalized intersections, an equivalent value for the average delay per stopped vehicle was also computed at the unsignalized intersections using the following equation:

$$\text{Average Vehicle Delay} = 1/(\text{Reserve Capacity}/3600).$$

TABLE 2-5
Unsignalized Intersection
Level of Service Criteria

LOS	Reserve Capacity	Minor Street Delay
A	> 400	Little or no delay
B	300 - 399	Short traffic delays
C	200 - 299	Average traffic delays
D	100 - 199	Long traffic delays
E	0 - 99	Very long traffic delays
F	< 0	Extremely long delays

Source: Highway Capacity Manual (Transportation Research Board, Special Report 209, 1985)

2.5.3 Results

In order to identify problem intersections to be included in the level of service analysis a screening process was undertaken. Existing problem locations were identified by travel time, average speed and accident data analyses as outlined in the Route 20 Corridor Planning Study: Short Range Element. Each of the unsignalized intersections that were identified from this screening and all of the signalized intersections along the corridor have been included in the 1987 existing conditions analysis. A summary of the results presented in the Short Range Element broken down by city or town is shown in Tables 2-6 through 2-9.

Route 20 @	1987 Conditions
Summer Street	
Route 20 WB left turns	C/18
Summer St. NB	F/*
Wellesley St./Old Boston Post Road	
Route 20 EB left turns	C/13
Route 20 WB left turns	B/10
Wellesley St. NB	F/*
Old Boston Post Road SB	F/*
School Street (signalized)	
Route 20 EB	F/120+
Route 20 WB	F/120+
School Street NB	F/120+
School Street SB	F/120+
Overall Intersection	F/120+
Highland Street/Old Boston Post Road	
Route 20 EB left turns	C/14
Route 20 WB left turns	B/11
Highland St. NB	F/*
Old Boston Post Road SB	F/*

KEY:
- X/XX — Level of service/delay in seconds (PM peak hour).
- F/* — Analysis equations not applicable at this level of delay. Drivers forced to accept unsafe gaps in traffic.
- F/120+ — Degree of failure beyond limits of analysis equations. Delay in excess of 120 seconds.

TABLE 2-6
Weston
1987 Levels-of-Service

Route 20 @	1987 Conditions
Old Connecticut Path	
Route 20 WB left turns	F/*
Old Connecticut Path NB	F/*
Route 27/126 (signalized)	
Route 20 EB	F/120+
Route 20 WB	F/120+
Route 27/126 NB	F/120+
Route 27/126 SB	F/120+
Overall Intersection	F/120+
Pelham Island Road	
Route 20 EB left turns	A/9
Route 20 WB left turns	A/8
Pelham Island Road NB	E/83
Pelham Island Road SB	D/33

KEY:
- X/XX — Level of service/delay in seconds (PM peak hour).
- F/* — Analysis equations not applicable at this level of delay. Drivers forced to accept unsafe gaps in traffic.
- F/120+ — Degree of failure beyond limits of analysis equations. Delay in excess of 120 seconds.

TABLE 2-7
Wayland
1987 Levels-of-Service

Route 20 @	1987 Conditions
Goodman Hill Road	
Route 20 EB left turns	C/13
Summer St. NB	
- left turns	E/225
- right turns	C/12
Landham Road	
Route 20 WB left turns	E/72
Landham Road NB	
- left turns	F/*
- right turns	C/15
Concord Road (signalized)	
Route 20 EB	F/120+
Route 20 WB	C/20
Concord Road SB	E/44
Overall Intersection	F/120+
Union Avenue (signalized)	
Route 20 EB	C/14
Route 20 WB	B/11
Shopping Center NB	F/*
Union Avenue SB	F/*
Overall Intersection	F/120+
Nobscot Road	
Route 20 WB left turns	F/*
Nobscot Road NB	F/*
Dudley Road	
Route 20 WB left turns	A/7
Dudley Road NB	F/*
Horse Pond Road	
Route 20 EB left turns	D/20
Horse Pond Road SB	F/*

KEY:
- X/XX — Level of service/delay in seconds (PM peak hour).
- F/* — Analysis equations not applicable at this level of delay. Drivers forced to accept unsafe gaps in traffic.
- F/120+ — Degree of failure beyond limits of analysis equations. Delay in excess of 120 seconds.

TABLE 2-8
Sudbury
1987 Levels-of-Service

Route 20 @	1987 Conditions
Wayside Inn Road/Hager Street (signalized)	
Route 20 EB	B/8
Route 20 WB	F87
Hager Street NB	C/33
Wayside Inn Road SB	C/22
Overall Intersection	E/52
Wilson Street/Farm Road (signalized)	
Route 20 EB	D/29
Route 20 WB	F/60
Farm Road SB	C/22
Wilson St. NB	D/30
Overall Intersection	E/43
Hosmer Street SB	
Route 20 EB	B/8
Route 20 WB	D/40
Hosmer St. SB	D/28
Overall Intersection	C/25
Lincoln Street/Stevens Street (signalized)	
Route 20 NB	C/18
Route 20 WB	D/40
Lincoln Street EB	D/28
Stevens Street SB	C25
Overall Intersection	F/73
Pleasant Street/South Street (signalized)	
Route 20 EB	B/12
Route 20 WB	F/120+
South Street NB	F/120+
Pleasant Street SB	F/29
Overall Intersection	F/118
Glen Street (signalized)	
Route 20 EB	F/120+
Route 20 WB	B/7
Glen Street NB	B/12
Overall Intersection	F/120+

KEY: X/XX Level of service/delay in seconds (PM peak hour).
F/120+ Degree of failure beyond limits of analysis equations. Delay in excess of 120 seconds.

TABLE 2-9
Marlborough
1987 Levels-of-Service

3 Future Conditions

3.1 1995 SOCIOECONOMIC CHARACTERISTICS

Although alternatives were not presented for the year 1995, the process for estimating 1995 socioeconomic data is discussed because the data were used as the foundation for the 2010 forecasts. The 1995 town level population and employment forecasts by Metropolitan Area Planning Council (MAPC) were used as control totals.

In order to distribute the town total household growth forecasted to occur between 1987 and 1995 into traffic zones, housing development proposals (see Appendix F) with completion dates between 1987 and 1995 were located in the appropriate zones and added to the base year (1987) households in those zones. This procedure allowed for an accurate distribution of household growth and was, therefore, used for the four Route 20 Corridor communities, Weston, Wayland, Sudbury and Marlborough. From Table 3-1, it can be seen that the city of Marlborough is the only one of the four communities that will experience a growth in population during this period. Housing development, however, will occur in each of the communities indicating that average household size will decrease. During the eight years, the number of households will increase by a low of 2.2% in Weston to a high of 10.2% in Marlborough.

The process for forecasting employment in the four Route 20 Corridor communities was similar to the one described above. The location, size and type of new commercial development were obtained from MAPC, from conversations with town planners, and through research of Environmental Notification forms. The ITE Trip Generation manual's Average Land Use Densities were used to estimate the number of employees per development based on size and type of development (see Appendix F for generation rates used). A vacancy rate was included for developments that were then vacant or that are scheduled to be completed in or near 1995. The number of new employees were then added to the base year employment in the appropriate traffic zones. The number of employees by traffic zones were summed to the town level and compared with MAPC's town total. In instances where there was not a favorable comparison, the proportion of the town total employment in each zone was determined, and then the remainder of the MAPC town total was distributed to the zones based on that proportion.

Community	Population			Households		
	1987	1995	% Change	1987	1995	% Change
Marlborough	32,775	34,000	3.74	11,746	12,949	10.2
Sudbury	14,000	14,000	0.0	4,562	4,921	7.9
Wayland	12,200	12,200	0.0	4,206	4,382	4.2
Weston	10,800	10,800	0.0	4,060	4,150	2.2
Total	69,775	71,000	1.8	24,574	26,402	7.4

TABLE 3-1
1987 and 1995 Population and Households

For areas outside of the four communities, the employment and population proportion of town totals per zone from the 1980 census were used to distribute MAPC's 1995 population and employment forecasts to the appropriate traffic zones.

Employment data at the community level are presented in Table 3-2. Data by traffic zone are presented in Appendix F. Retail employment will remain stable in Wayland and Weston, it will increase moderately in Sudbury, and it will increase by almost fifty percent in the city of Marlborough. Non-retail employment will remain unchanged in Wayland, but it will increase in the other communities. The greatest increases in non-retail employment will occur in Marlborough (53.9%) and Weston (48.4%). Most of the increase in Weston is attributed to the proposed Mass. Broken Stone development.

3.2 2010 SOCIOECONOMIC CHARACTERISTICS

Forecasts for the year 2010 were determined in a manner similar to those for 1995. MAPC's 1995 total population for each community was divided by the community's 1995 households to obtain the average household size for a given community . The estimated 2010 town population was divided by the 1995 average household size to obtain the total number of households in that community in 2010. The 1995 proportion of town total households in each traffic zone were applied to the total number of 2010 households at the town level to estimate the number of households by traffic zone.

The number of employees was estimated for each commercial development expected to be completed by 2010. These employees were added to the 1995 numbers in the appropriate zones. The number of employees in each traffic zone was summed to the town level and compared with MAPC's 2010 employment forecast for each community. The larger of the two sets of forecasts was always used. If MAPC's forecasts were higher, the difference was allocated based on the 1995 proportions to the zones.

For areas outside of the four communities, MAPC's forecasts were distributed to each zone using the 1995 proportions for households, retail, and non-retail employment per zone..

2010 population and employment data are presented in Tables 3-3 and 3-4. The population in Sudbury, Wayland, and Weston is expected to remain static during the twenty-three years covered by the study. A moderate increase will occur in Marlborough. The number of households will increase in all communities with the larger percentage increases occurring in Wayland and Marlborough. Approximately two-thirds of the additional households in Marlborough will be formed between 1987 and 1995. In Wayland, about two-thirds of the new households will be formed after 1995.

Community	Retail Employment 1987	1995	% Change	Non-Retail Employment 1987	1995	% Change
Marlborough	2,169	3,196	47.3	15,526	23,888	53.9
Sudbury	1,891	2,011	6.3	7,898	8,969	13.6
Wayland	1,195	1,195	0.0	2,125	2,125	0.0
Weston	413	413	0.0	3,189	4,731	48.4
Total	5,668	6,815	20.2	28,738	39,712	38.2

TABLE 3-2
1987 and 1995 Retail and Non-Retail Employment

Community	Population			Households		
	1987	2010	% Change	1987	2010	% Change
Marlborough	32,775	35,250	7.55	11,746	13,602	15.80
Sudbury	14,000	14,000	0.00	4,562	4,921	7.87
Wayland	12,200	12,200	0.00	4,206	4,711	12.01
Weston	10,800	10,800	0.00	4,060	4,150	2.22
Total	69,775	72,250	3.55	24,574	27,384	11.43

TABLE 3-3
1987 and 2010 Population and Households

Community	Retail Employment 1987	2010	% Change	Non-Retail Employment 1987	2010	% Change
Marlborough	2,169	3,872	78.52	15,526	34,806	124.18
Sudbury	1,891	2,198	16.23	7,898	9,802	24.11
Wayland	1,195	1,195	0.00	2,125	2,355	10.82
Weston	413	413	0.00	3,189	5,394	69.14
Total	5,668	7,678	35.46	28,738	52,357	82.19

TABLE 3-4
1987 and 2010 Retail and Non-Retail Employment

The largest percentage change in employment is expected to occur in Marlborough. Non-retail employment in this community is estimated to more than double by 2010. Retail employment will increase by approximately seventy-eight percent. Non-retail employment in Weston is expected to increase by sixty-nine percent.

3.3 TRAVEL DEMAND FORECASTS

3.3.1 The Modeling Process

CTPS used a microcomputer based software package, The Highway Emulator (THE),[1] to forecast travel demand for the Route 20 Corridor. Complete documentation of THE is available at CTPS. The following is a brief description of the method THE uses in each step of the traditional four step travel demand forecasting process.

Trip Generation

THE relies on trip generation rates established in NCHRP Report #187[2] (referred to as the QRS manual). The QRS Manual estimates trip productions on the basis of zonal household data (number of zonal households and average household income). Trip attractions are estimated on the basis of zonal households, zonal retail employment, and zonal non-retail employment. The QRS manual refines its trip generation estimates through the use of scaling factors based on urban area population. These factors can be used to translate total productions and attractions into auto driver trips, and to scale 24-hour trip generation estimates to specific time periods.

Trip Distribution

THE uses the gravity model in its trip distribution phase. The QRS manual provides factors that can be applied to the resultant trip table to estimate trips by purpose for specified time periods. As in trip distribution, these factors are based on urban area population. THE converts trip tables in production/attraction format to origin/destination (O/D) format through the use of origin and destination factors. These factors were derived from FHWA - Office of Planning Report No. FH-11-7519.[3]

---

[1]The Highway Emulator (THE) software package was written by Edward Bromage while employed by CTPS

[2]National Cooperative Highway Research Program, Report #187: Quick-Response Travel Estimation Techniques and Transferable Parameters User's Guide, Transportation Research Board, Washington, D.C. 1978.

[3]An Analysis of Urban Area Travel by Time of Day, Department of Transportation, Federal Highway Administration, Office of Planning, Report No. FH-11-7519, Washington, D.C., 1972. Prepared by Peat, Marwick, Mitchell & Co., Boston, Massachusetts.

Mode Split

THE does not perform mode split. THE extracts auto driver trips from total trips during trip generation.

Trip Assignment/Model Calibration

THE will estimate an O/D trip table directly from observed traffic counts. It is also capable of calibrating an existing O/D table to observed traffic counts. The calibration algorithms employed by THE are based on a maximum entropy algorithm developed and refined by H.J. Van Zuylen and Professor L.G. Willumsen of the University of Leeds.[4] The maximum entropy theory assumes that travel patterns fit the highest possible degree of disorder. This assumption is used to estimate a trip table that is most likely to reproduce a set of observed traffic counts.

THE uses conventional capacity restrained algorithms to assign a trip table to a network. It is capable of single iteration assignments (all-or-nothing) and multiple iteration assignments. In a multiple iteration assignment each iteration is weighted equally in calculating the final assignment. THE employs Moore's algorithm to determine the shortest path between zone pairs. The BPR (Bureau of Public Roads) curve is used to account for capacity effects on network links. This curve determines the increase in a link's travel time due to an increase in the link's volume-to-capacity ratio. Travel time is developed incrementally by combining the current iteration's travel time with the previous iteration's travel time in a 1:3 ratio.

3.3.2 The Route 20 Traffic Forecasting Model

The Route 20 traffic forecasting model consists of 247 traffic zones and 2,143 links. Zone connectors and turning links were coded with default values (length: 0.01 miles, speed: 60 miles/hour, capacity: 6,000 vehicles/hour). The travel time resulting from these defaults was added to the zone's terminal time, which was determined on the basis of urban area population and zone location. For roadway segments less than 0.75 miles in length, capacity was based on that of the intersections at each end of the segment. For roadway segments greater than 0.75 miles, capacity was based on data from the MDPW's Road Inventory file and from field observation, and reflects level-of-service E operating conditions. Link speeds were determined in a similar fashion. Segment lengths were obtained from 1,000-scale MDPW maps and the Road Inventory.

The Route 20 model was calibrated to 1987 traffic volumes. Traffic counts were available on approximately 500 network links. The calibrated 1987 PM peak

---

[4]Henk J. Van Zuylen and Luis G. Willumsen, The Most Likely Trip Matrix Estimated From Traffic Counts, Transportation Research, Volume 148, pp 281-293.

period assignment was within 8.5 percent root mean square error (% RMSE) of observed counts.

3.4 ALTERNATIVES

3.4.1 Development of Alternatives

The process of developing long-range improvement strategies for the Route 20 corridor was one that emphasized cooperation among the four communities of Weston, Wayland, Sudbury and Marlborough. Through regular meetings of the MetroWest Transportation Task Force, community representatives presented and discussed long-range plans for Route 20. Community representatives were also presented with a number of corridor-wide improvement alternatives developed by CTPS. These corridor-wide alternatives, discussed below are regional in scope and were initially developed with specific improvements strategies that would be compatible with each affected community's long-range goals. From the following six alternatives, local communities then formulated specific improvement alternatives that were subsequently analyzed by CTPS in detail.

Do Nothing

In this case, the do nothing alternative would mean implementation of the Route 20 Corridor Planning Study: Short Range Element. No other long-range solutions would be considered.

Two-Lane Route 20

Under this alternative Route 20 would remain a two-lane roadway in Marlborough, Sudbury, Wayland and Weston. Intersections would be upgraded to provide levels of capacity suitable for the two-lane segments. Evaluation of this strategy would consider issues such as the extent to which future-year traffic would be forced to divert from Route 20 onto other highway facilities such as the Massachusetts Turnpike.

By not constructing additional through lanes on Route 20, various other alternatives to supplement the existing two-lane capacity may be required. These improvements may include the construction of bypass roads, frontage and service roads, and construction of new parallel facilities.

For the Route 20 two-lane alternative to be successful it would be necessary for local communities to aggressively control and tighten local access to the roadway. Actions may include consolidation of existing curb-cuts, institution of curb-cut density caps (e.g., three per mile), and zoning/land-use changes to maintain manageable conditions along the facility.

Two-Lane Route 20 With Improvements at Critical Locations

This alternative would be intended to provide as much capacity as possible, wherever possible, while keeping Route 20 essentially a two-lane facility. Conceptually, Route 20 would essentially remain a typical two-lane highway, however, some sections would be upgraded to operate as an urban arterial. This improvement effort would be geared to providing a greater number of passing opportunities by creating four-lane sections wherever necessary and by timing signals to ensure arterial progression. Intersections would be upgraded to enhance capacity and safety along Route 20. Unsignalized intersections would be scheduled for signalization as warrants are met. Existing signalized locations would be upgraded to maximize capacity in accordance with growing demands. Signal interconnections or coordination schemes would be implemented to achieve arterial progression. In areas of denser development where traffic makes heavy left turns, the roadway might be reconfigured into a three-lane section with a continuous two-way left-turn lane. The final configuration would be dependent on local need, community support, and the technical feasibility of making the desired improvements. For example, Route 20 in Marlborough might be widened in accordance with plans adopted by the community, however, once in Sudbury the roadway would revert to two lanes. Here localized improvements would be made as needed and where possible. Similarly, in Wayland and Weston road segments would be widened to four lanes wherever right-of-way was available and the improvement practicable.

Four-Lane Route 20

The four-lane Route 20 option would essentially be a rebuilding of the current roadway to provide uniform four-lane sections from Route 128 in Weston through Marlborough. The resulting roadway configuration would be similar to that currently proposed by the city of Marlborough for improving Route 20 East in that community.

Five-Lane Route 20 at Critical Locations

The five-lane Route 20 option is essentially an expansion of the four-lane option at intersections and along sections of the road where roadside development has resulted in heavy left-turn demands. At those intersections where capacity problems exist or would be expected in the future, widening would be made to allow the construction of additional approach lanes. In heavily developed areas where vehicle queues in the median area interfere with through movements median lanes would be constructed to better control left-turn conflicts and minimize the interruption of through movements.

The MDPW has designed a five-lane segment plan for a section of Route 20 in Sudbury. The plan called for the equivalent of a five-lane cross-section along segments to allow for the left-turn lane storage space and for smooth transitions

between intersections. A four-foot wide raised median barrier would be used to separate opposing flows. The plan became known as the "waiver" plan because of the need for a waiver from the Federal Highway Administration to permit the use of two-foot curb offsets in place of ten-foot shoulders. This would reduce the required right-of-way by 16 feet between intersections. Intersections would be widened as necessary to provide level of service "C" or better conditions for the design year.

Segmented Improvement Plan

Under this option a Route 20 improvement plan would be developed in an incremental manner according to local traffic demands. The final plan may be similar in some ways to the "Two-Lane Route 20 with Improvements at Critical Locations" alternative, however, it is also likely that there would be substantial other operational and geometric changes that would be considered. Among these would be one-way street systems, separate regional and local facilities, extension of local streets to service major generators, and the consolidation of driveways along a single frontage road with limited access/egress points.

The feasibility of improving Route 20 in this manner would be contingent upon the availability of long-term community commitment and support for local improvements. This is because any plan to realistically address the long-term Route 20 problem in this way would contain a substantial land-use component. For example, land currently occupied or currently used for a purpose other than what would be proposed as part of the improvement plan would have to be so designated and future changes structured to make available the land needed for the long-range Route 20 improvements. It would, therefore, be necessary for local communities to not only actively support the agreed upon improvement plan, but also to identify a mechanism to preserve the long-term integrity of their commitment, such as, revising municipal master plans to reflect required land-use changes.

The pursuit of this kind of alternative exceeds the more traditional approach to long-range planning in that it would require a more closely coordinated effort between state and local representatives than is typically the case. In this effort, the state and local communities would develop a coordinated land use and transportation plan for the Route 20 Corridor.

3.4.2 Alternatives Analysis

The following alternatives were selected by local communities for detailed analysis by CTPS. These alternatives were tested using the CTPS highway simulation model developed for the Route 20 study area. The model produces detailed traffic forecasts for the year 2010 during the PM peak hour.

Alternative 1 - 2010 No-Build

This alternative includes only those committed highway improvements that are currently expected to be in place before 2010. Essentially, these include intersection improvements recommended in the Route 20 Corridor Planning Study: Short Range Element and recent development mitigation. A description of the "no build" assumptions is included in Appendix G. As such, it is called the "no build" alternative. Figure 3-1 presents No-Build 2010 PM peak hour traffic volume forecasts for Route 20. These volumes are used as a point of reference for comparing the impact of highway improvements on Route 20 traffic forecasts.

Future travel demands will cause evening traffic patterns along Route 20 to shift somewhat, producing a more obvious difference between eastbound and westbound traffic flows. Under this No-Build configuration, the westbound orientation of the evening peak hour should become more pronounced. The most obvious example of this trend is the split between eastbound and westbound flows at Route 128 in Waltham. In 1987, PM peak hour westbound traffic accounted for about 53% of the total. By 2010, the quicker growing westbound demand should makeup almost 58% of the PM peak flow. This increased westbound directionality will occur despite a better than 20% increase in eastbound traffic.

The 2010 No-Build volumes range from a low of 900 westbound and 600 eastbound at the Marlborough/Northborough line, to a high of 2300 westbound and 1,700 eastbound at the Weston/Waltham line. This compares to a 1987 volume of 600 westbound and 400 eastbound at the Marlborough/Northborough line and 1,600 westbound and 1,400 eastbound at the Weston/Waltham line. This indicates that peak hour traffic volumes will increase by 43 percent to 50 percent westbound and 21 percent to 50 percent eastbound in the next 20 years if the roadway is left essentially unimproved. However, depending on the location, demand may be substantially higher.

The heaviest traffic increases are anticipated in the communities at either end of the study area, Weston and Marlborough. With the orientation peaking in the westbound direction, traffic increases westbound are expected to be in the range of 500 - 700 vehicles per hour. Similar increases in the peak direction are also expected on sections in Marlborough east of I-495. Hourly totals in Marlborough (typically between 1400 and 2200 VPH) should, however, continue to be somewhat lower than those in Weston (typically between 1800 and 2200 VPH).

The increases in traffic volume on an unimproved Route 20 in the communities of Wayland and Sudbury are expected to be more moderate. Hourly increases should be in the range of 200 vehicles in either direction. Future year traffic levels should also be similar in the two communities, with peak hour volumes at most locations in the 1000 to 1200 VPH range in either direction. The lowest volume segment between the two will be in west Sudbury, while the highest will be in east Wayland.

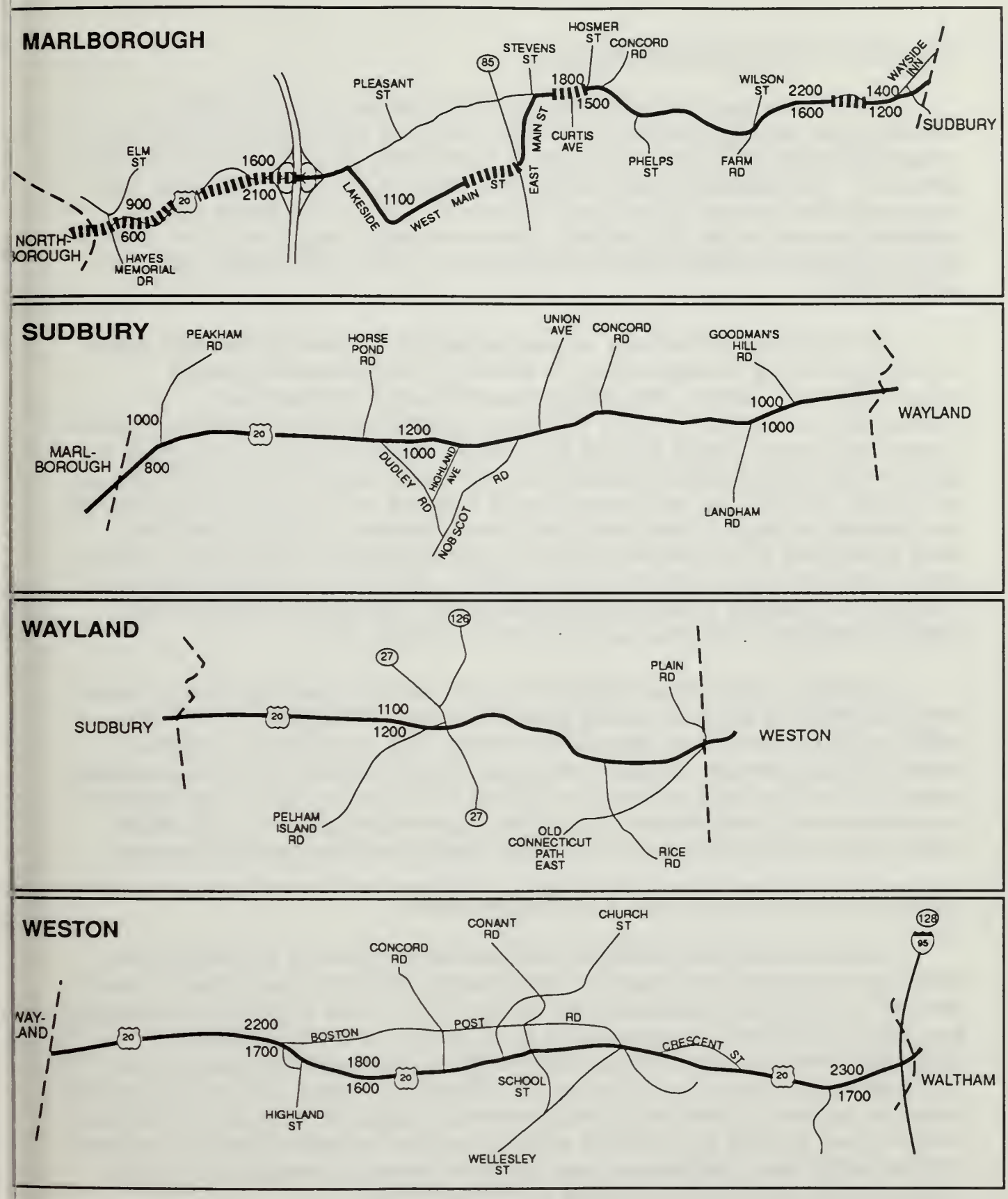


FIGURE 3-1
Alternative 1: No-Build
Traffic Volumes, 2010 PM Peak Hour

Alternative 2 - 2010 Four-Lane Route 20

This alternative would essentially double the capacity of Route 20 by converting the two-lane road into four lanes. Doubling the capacity of Route 20 would dramatically increase the volume of traffic using the road during the evening peak hour. The additional traffic, called latent demand, is traffic using using local roads under the No-Build alternative. As shown on Figure 3-2, traffic volume increases in excess of the 2010 no-build alternative would range from a low of 200 VPH on sections in Marlborough and Weston, to a high of 700 to 800 in Wayland and Sudbury.

The Wayland and Sudbury sections experience the greatest volume increase as a result of adding through capacity to Route 20. This increase is probably influenced by two factors. First, the sections of Route 20 in Weston and Marlborough are expected to carry the highest volumes of traffic regardless of which alternative is tested. This is because, for a large number of the trips being made in these communities, Route 20 provides the most direct means of travel for some part of the trip. However, in the communities of Wayland and Sudbury, individuals can use alternates to Route 20 and avoid peak hour congestion. For example, Plain Road in Wayland is an alternate route for motorists destined to Route 126. Second, use of Route 20 would become more favorable in all communities, particularly in Wayland and Sudbury where base traffic levels are relatively low, (1000 to 1200 VPH) as compared to Marlborough and Weston (1800 to 2200).

In general, the four-lane alternative would have the potential to draw about 50% more traffic to Route 20 in 2010 than would the no build alternative. This traffic would be drawn from other facilities being used as alternates. The major benefit of this alternative to study area communities is reduced travel on residential streets that could be used as alternates to Route 20. However, such a large increase in capacity would also compete with parallel, regional facilities and could attract traffic from roadways such as Route 30 and possibly the Massachusetts Turnpike.

Alternative 3 - Four-Lane Route 20 in Marlborough

This alternative was developed and considered primarily to examine how doubling the capacity of the road in Marlborough would affect traffic flows in other corridor communities. Specifically, the greatest concern was whether or not building four lanes in Marlborough would result in an increase in traffic in Sudbury. Assignment results suggest that doubling Route 20 capacity in Marlborough will have a minimal effect on traffic volume in Sudbury (see Figure 3-3). In addition, the impact on Sudbury is restricted to the westernmost section of Route 20. Here, peak hour volumes increase by about 200 vehicles per hour (in either direction) over the 2010 "no build" base. Further east, near Sudbury Center, an increase of about 100 would be expected westbound, during the PM peak hour.

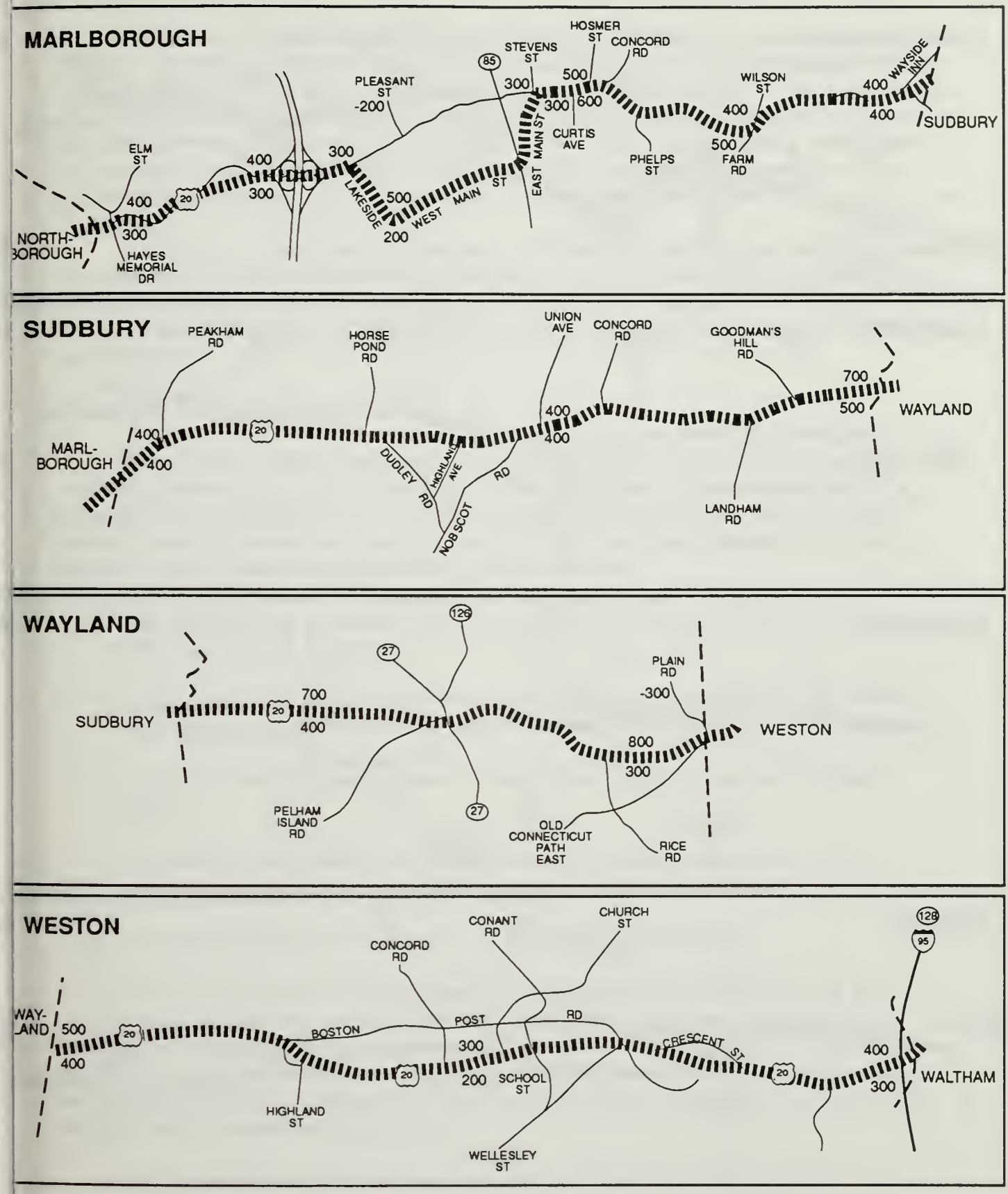


FIGURE 3-2
Alternative 2: 4-Lane Route 20
Traffic Volume Changes from No-Build, 2010 PM Peak Hour

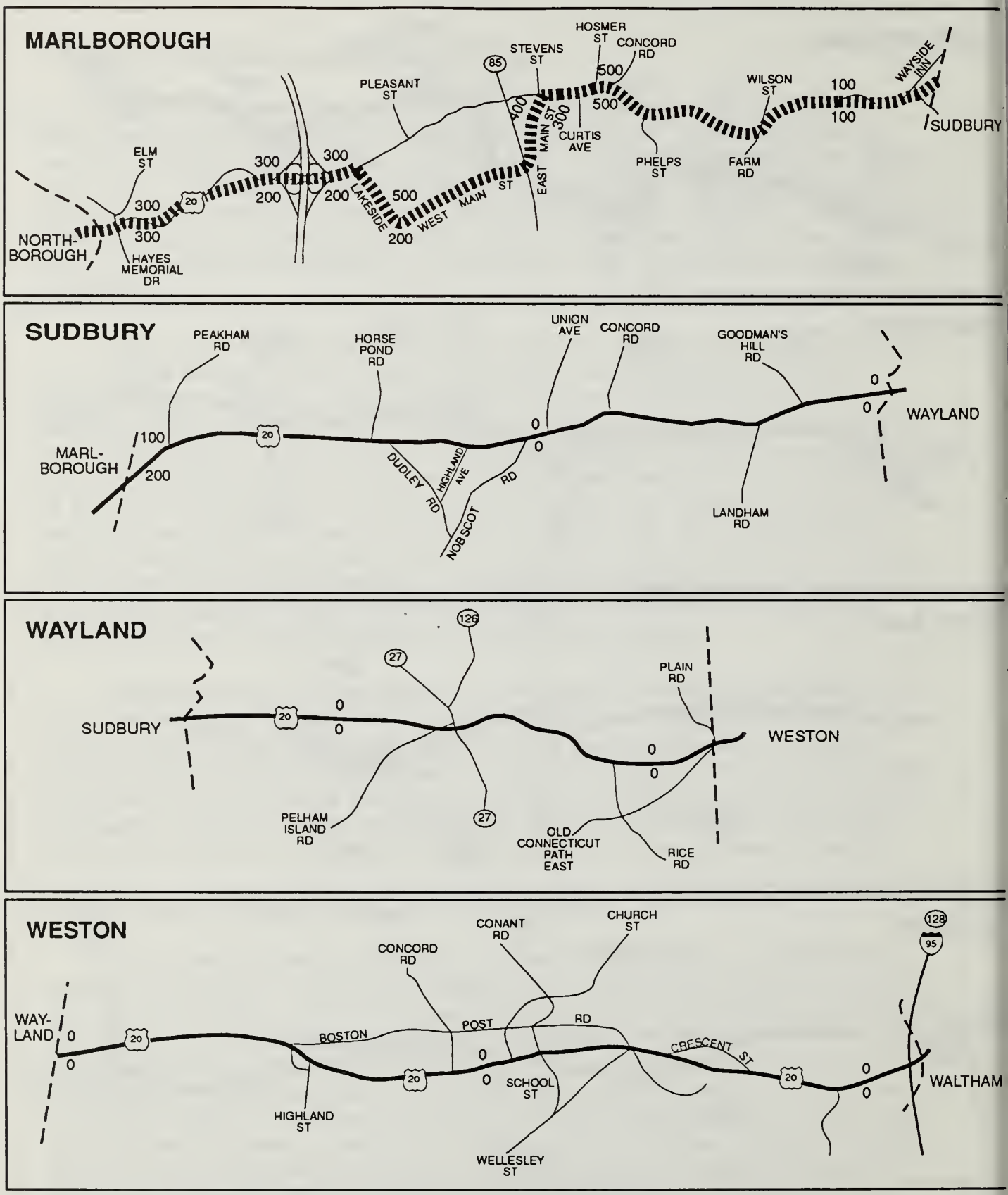


FIGURE 3-3
Alternative 3: 4-Lane Route 20, Marlborough/
2-Lane Route 20, Sudbury through Weston
Traffic Volume Changes from No-Build, 2010 PM Peak Hour

The cause of these increases is not, however, a spillover of new volume into Sudbury. Rather the effect of adding capacity in Marlborough is to re-establish Route 20, in this section of the study area, as the preferred east-west route. This new capacity effectively draws traffic away from local streets north of Route 20 that are now used by residents traveling between Sudbury and Marlborough. By improving conditions on the congested section of Route 20 in Marlborough, travel time on the two sections (Sudbury and Marlborough) will be lower than local roads.

It should be noted that this finding is valid as long as there are sufficient land use controls in place in Marlborough, Sudbury, Wayland and Weston to ensure that the increased capacity (accessibility) of Route 20 does not induce new development along the corridor that substantially exceeds the land use projections used in this planning study.

Alternative 4A - Segmented Option 1

Three options were developed under alternative 4 which included specific roadway, geometric or traffic flow improvements. These improvements were analyzed in conjunction with widening Route 20 to four lanes in Marlborough. Route 20 would remain two lanes in Sudbury, Wayland and Weston. Alternative 4, Option 1, would include the following improvements:

- The realignment of Nobscot Road and Union Avenue to remove the dogleg with Route 20 in Sudbury
- A new Route 20 alignment in Wayland beginning at the Wayland/Weston town line north of Route 20 to a point west of the Route 20/126/27 intersection
- A one-way traffic flow scheme in Weston on School Street and Wellesley Street
- A three-lane section east of School Street in Weston to the Route 128 interchange with two lanes eastbound and one lane westbound
- A direct connection of Route 117 in Waltham to Route 128

The effects of these improvements on Route 20 in Marlborough and the western side of Sudbury are similar to the four-lane Marlborough alternative. Volumes in Marlborough increase from 200 to 400 VPH depending on the location (see Figure 3-4). On the western most section in Sudbury, volume increases are in the range of 200 VPH. Further east, near the town center, volumes are up by about 100 VPH in the westbound direction.

At the realigned Nobscot Road/Union Avenue intersection, volumes on existing Route 20 are reduced by about 400 to 500 VPH in each direction.

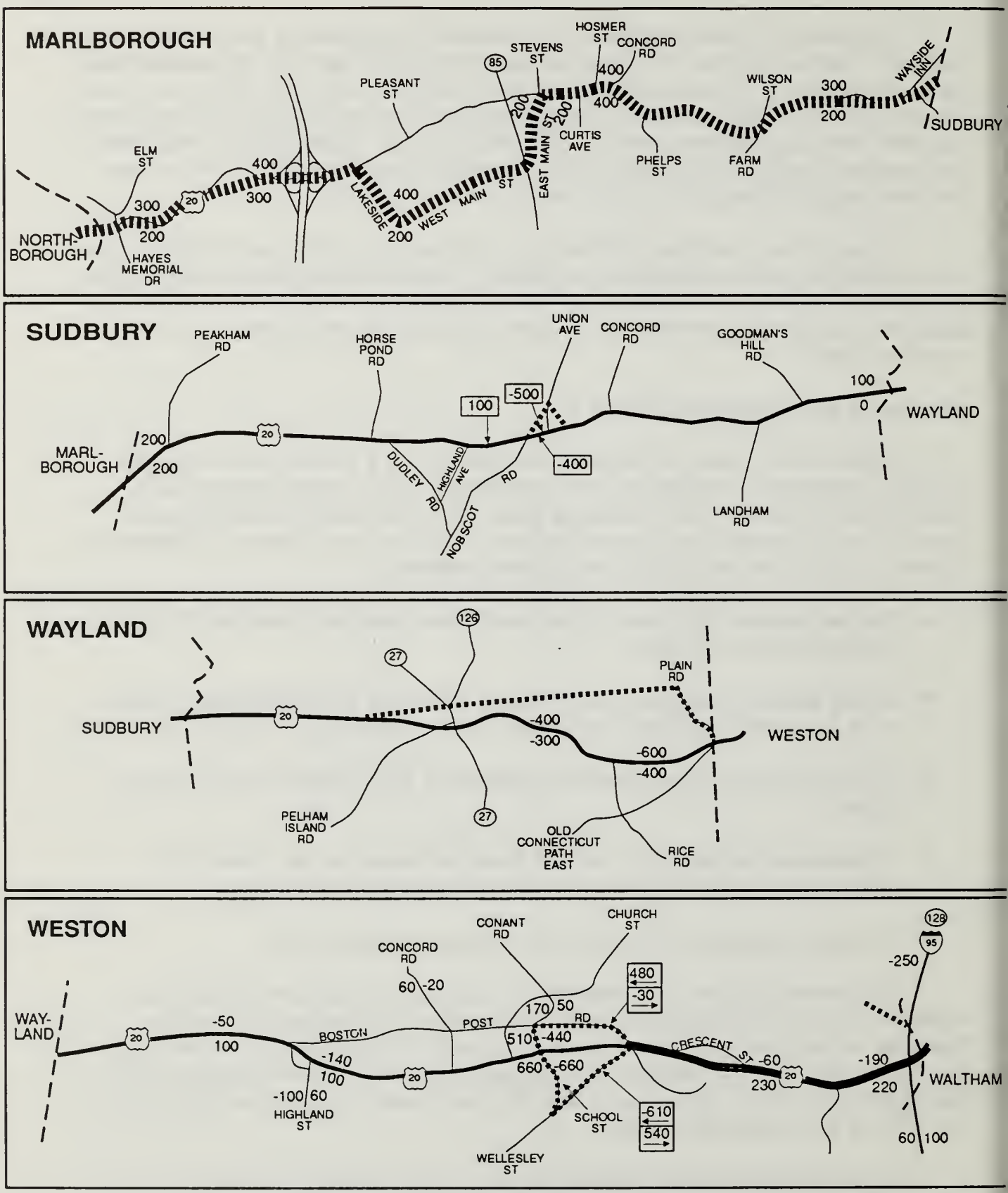


FIGURE 3-4
Alternative 4A: Segmented Option 1
Traffic Volume Changes from No-Build, 2010 PM Peak Hour

The construction of the Wayland bypass would cause peak hour westbound traffic on Route 20 to drop by 400 to 600 VPH. and eastbound traffic to drop by 300 to 400 VPH. This traffic would be diverted to the new bypass.

In Weston, the one-way pair and the three lane section would together result in the traffic volume changes shown in Figure 3-4.

Alternative 4B - Segmented Option 2

This option differs from the first segmented option in that a Village Center bypass in Sudbury has been extended along the railroad right-of-way to the northwest to meet the Raytheon parcel to enable employees to enter/exit from and to the north without using Route 20. The Nobscot Road/Union Avenue realignment is unaffected by this alternative.

The effects of this improvement scheme are local to the Village Center Bypass area of Route 20 in Sudbury (see Figure 3-5). Approximately 700 VPH westbound and 500 VPH eastbound would be attracted to the Village Center bypass with corresponding decrease on Route 20, parallel to the bypass.

Alternative 4C - Segmented Option 3

Segmented Option 3 differs from Segmented Option 2 only in Sudbury. For this option, the Village Center Bypass has been extended to form an arc to the north of Route 20 from Station Road in the east to Horse Pond Road to the west. Refer to Figure 3-6. This bypass option would reduce Route 20 volume to the east of the Nobscot Road extension, by 600 VPH westbound and 700 VPH eastbound. To the west of the Nobscot Road extension, existing Route 20 volume would drop by about 1,200 VPH in either direction.

These changes in volume on existing Route 20 presume that the Village Center Bypass would be designed and built in such a way, that it would be easier and faster for motorists to use the new two-lane bypass than to venture into and pass through the Village Center. Under these conditions, the bypass would have the desired effect. Peak hour through traffic would divert to the bypass in proportion to the reductions on existing Route 20. Heaviest volumes, in the range of 1100 VPH per direction, would use the side west of the Nobscot Road extension. East of here, peak hour volumes would be in the range of 850. The heavier volumes to the west of the Nobscot Road extension reflect Raytheon employees who would use the bypass instead of Route 20 to access the Nobscot Road extension (east of their site) and west Route 20 (west of their site). Through the Village Center, peak hour volumes would likely be in the range of 400 vehicles per hour. Village Center traffic could, however, vary depending on the mix of use and the actual amount of development by 2010.

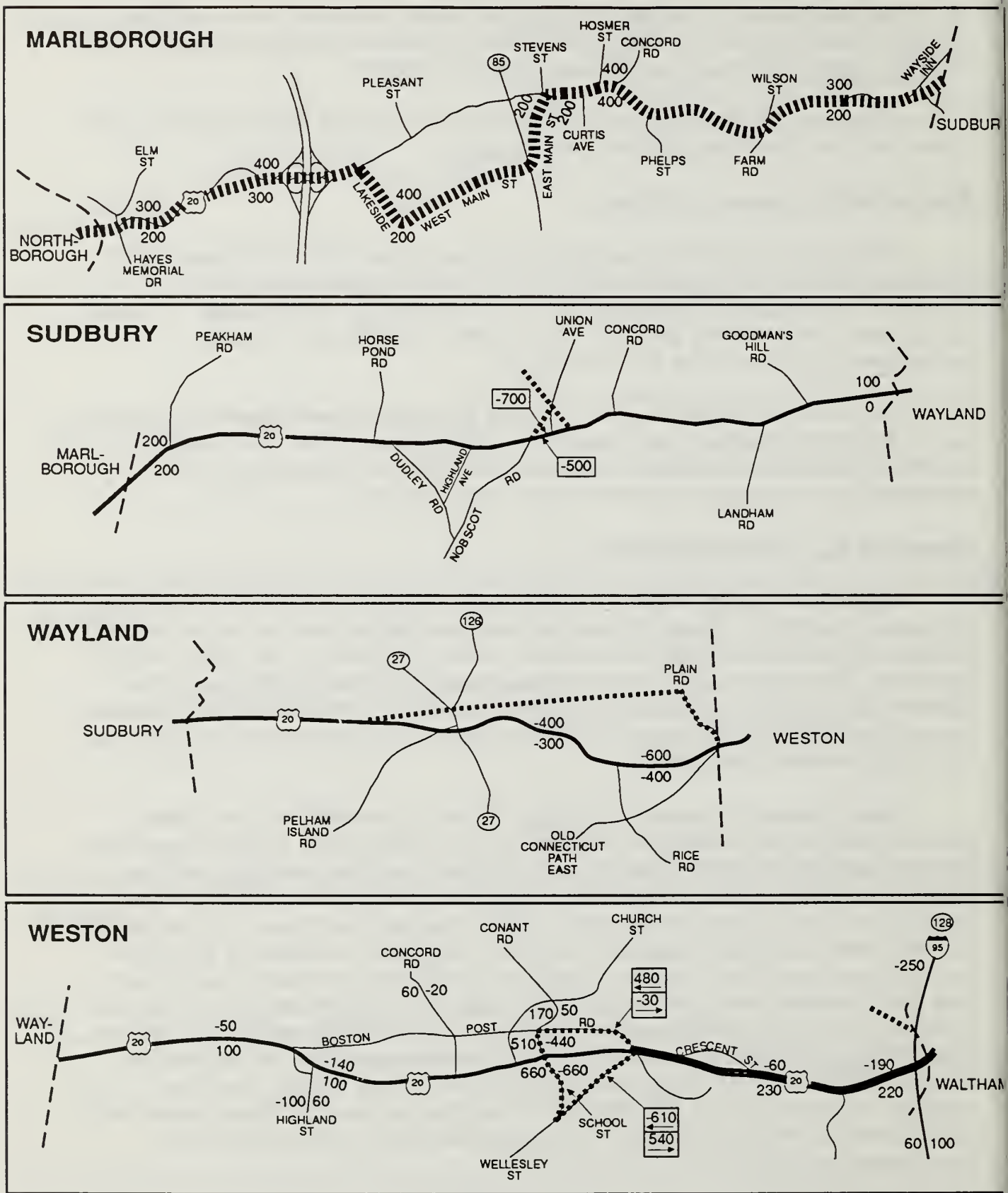


FIGURE 3-5
Alternative 4B: Segmented Option 2
Traffic Volume Changes from No-Build, 2010 PM Peak Hour

2 lanes
4 lanes
3 lanes
Proposed

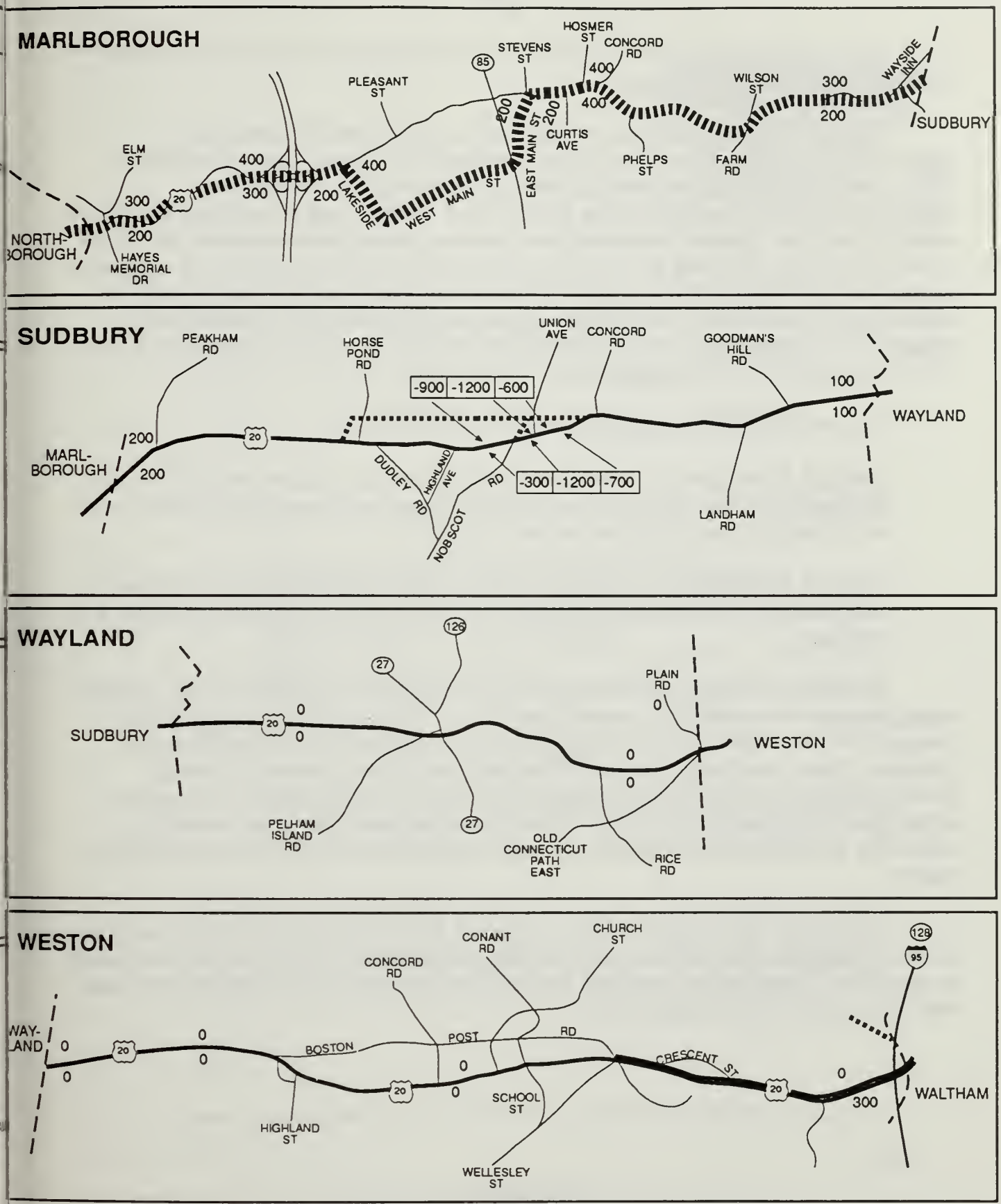


FIGURE 3-6
Alternative 4C: Segmented Option 3
Traffic Volume Changes from No-Build, 2010 PM Peak Hour

3.4.3 Selection of Alternatives

The alternatives analysis was presented to the Route 20 community representatives at the MetroWest Transportation Task Force meeting in June of 1990. The objectives of the meeting were to elicit from the community representatives their reaction to the analysis and to select one or two alternatives for detailed analysis. Rather than attempt to reach an immediate consensus on a final set of alternatives, the Task Force decided it would be appropriate to have a separate meeting with the community representatives where the analysis results could be independently reviewed. The product of the meeting was a letter, (displayed in Figure 3-7), suggesting two Build alternatives for further study and requesting that all other alternatives be dropped from consideration.

The two alternatives suggested for further study were:

- Selected Alternative 1 - Four lanes in Marlborough, Segmented Option 1 in Sudbury, two lane Route 20 in Wayland, three lane Route 20 in Weston east of Wellesley Street with no one-way scheme.

- Selected Alternative 2 - All of the same features in Marlborough, Wayland, and Weston, but substituting Segmented Option 3 for Segmented Option 1 in Sudbury.

In addition to these specific roadway treatments, the Task Force also indicated strong support for pedestrian access along Route 20, noting that the long-range character of the road should provide for semi-rural pedestrian access wherever possible. More specifically, the Task Force suggested that intersection design recommendations should provide signal hardware to accommodate pedestrian crossings at all signalized locations. In addition, the feasibility of constructing sidewalks in the Route 20 right-of-way was suggested for review in the long-range study.

Finally, the Task Force indicated support for additional examination of Travel Demand Management (TDM) approaches for improving Route 20 travel conditions in the future. Specifically, a request was made to explore the potential for park and ride and public transit alternatives.

METROWEST
Growth Management Committee
13 East Central Street
Natick, MA 01760
508•651•7350

June 25, 1990

Mr. William Steffens
Manager, Traffic Analysis and Design
CTPS
10 Park Plaza
Boston, MA 02116

Subject: Route 20 Corridor Study, Long Range Alternatives

Dear Bill,

The MetroWest Transportation Task Force has reviewed the following alternatives for the long range transportation improvements to Route 20:

- Four Lanes from Marlborough through Weston.
- Four Lanes in Marlborough and Two Lanes Elsewhere.
- Segmented Option 1: Four Lanes in Marlborough, Sudbury Nobscot Extension, Wayland bypass, Weston one-way scheme and three lanes east of Wellesley Street.
- Segmented Option 2: As in Segmented Option 1 with Station Road extension in Sudbury.
- Segmented Option 3: As in Segmented Option 2 with full bypass in Sudbury.

The Task Force requests that CTPS under take further detailed study of the following alternatives:

- Four Lanes in Marlborough, Segmented Option 1 in Sudbury, Two Lanes in Wayland, Three Lanes in Weston with no one way scheme.
- As in the previous alternative with Segmented Option 3 in Sudbury.

Further, the Task Force requests that all other alternatives be abandoned at this time.

In addition, the Task Force would like to take this opportunity to register its strong support for pedestrian access in Route 20 planning. The Task Force believes that the long range character of Route 20 should provide for semi-rural pedestrian access

(cont.)

FIGURE 3-7
MetroWest Transportation Task Force, Response to Long Range Alternatives

Route 20 Alternatives
Page 2.

wherever feasible and warranted. Therefore, we believe the corridor study should promote intersection designs that accomodate pedestrian crossings via pedestrian actuated signals at all signalized intersections. Further, the study should explore the feasibility of accomodating sidewalks in the Route 20 right of way.

The Task Force supports additional study of demand management techniques. In particular, the Task Force is interested in exploring park and ride and public transportation alternatives.

The Task Force looks forward to your presentation in the Fall of the selected alternatives.

Sincerely,

Larry Franceschi 3rd

Larry Franceschi
Chairman MetroWest Transportation Task Force

cc: MetroWest Growth Management Committee
MetroWest Transportation Task Force

TT20LR.ALT

FIGURE 3-7 (cont.)
MetroWest Transportation Task Force,
Response to Long Range Alternatives

3.5 ANALYSIS OF SELECTED ALTERNATIVES

3.5.1 Assignment Results - Selected Alternative 1

Four-Lane Route 20 in Marlborough, Nobscot Road Extension in Sudbury, Two-Lane Route 20 in Wayland, Three-Lane Route 20 east of Wellesley Street in Weston

As done initially for the preliminary set of alternatives, a comparison was made between the 2010 No-Build alternative traffic assignments with the assignment results for each of the two alternatives selected for analysis. The results are shown in Figure 3-8. As compared to the No-Build alternative, this option, like all other four-lane Marlborough alternatives, would have its most significant impacts in Marlborough, where traffic volumes would increase by 200 to 500 VPH in either direction, depending on the location. In most other locations the effect of this alternative on traffic volume is localized where the improvements are made.

In Sudbury, the Nobscot Road extension would reduce Route 20 volumes between Nobscot Road and Union Street by 500 VPH westbound and 400 VPH eastbound. As with all four-lane Marlborough alternatives, Route 20 immediately west of the Marlborough/Sudbury lines would attract between 100 and 200 more vehicles per hour in both directions. This traffic is diverted from local streets to Route 20. In Wayland, no significant change in volumes resulted. In Weston, the two-lane eastbound, one-lane westbound option would attract about 300 more vehicles eastbound during the evening peak hour.

3.5.2 Assignment Results - Selected Alternative 2

Four-Lane Route 20 In Marlborough, Nobscot Road Extension and Full Bypass in Sudbury, Two-Lane Route 20 in Wayland, Three-Lane Route 20 east of Wellesley Street in Weston

As compared to the No-Build option, the effect of this set of alternative improvements on traffic volume is identical to Selected Alternative 1, except in Sudbury Center where a Village Center bypass is proposed to complement the Nobscot Road extension (see to Figure 3-9). Envisioned as a two-lane facility that would relocate existing Route 20 to the north, the bypass has the potential to capture all of the through traffic on Route 20. In terms of volume, this means the bypass would carry between 800 and 1,100 vehicles in either direction during the PM peak hour.

3.5.3 Transit Service Options

In a letter dated June 25, 1990, the MetroWest Transportation Task Force requested CTPS to explore, in addition to highway alternatives for Route 20, the feasibility of park-and-ride and other public transportation alternatives. During this

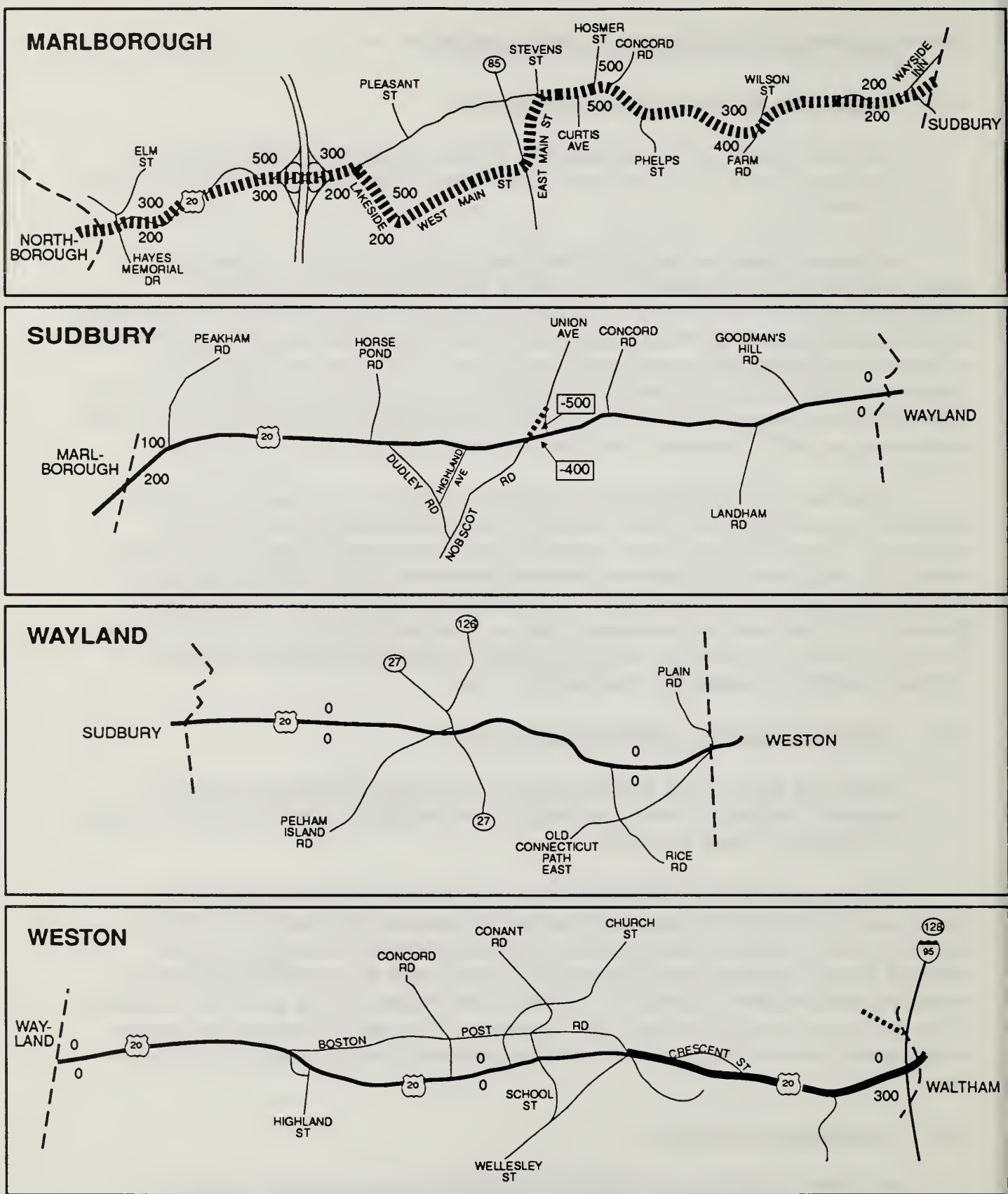


FIGURE 3-8
Selected Alternative 1
Traffic Volume Changes from No-Build, 2010 PM Peak Hour

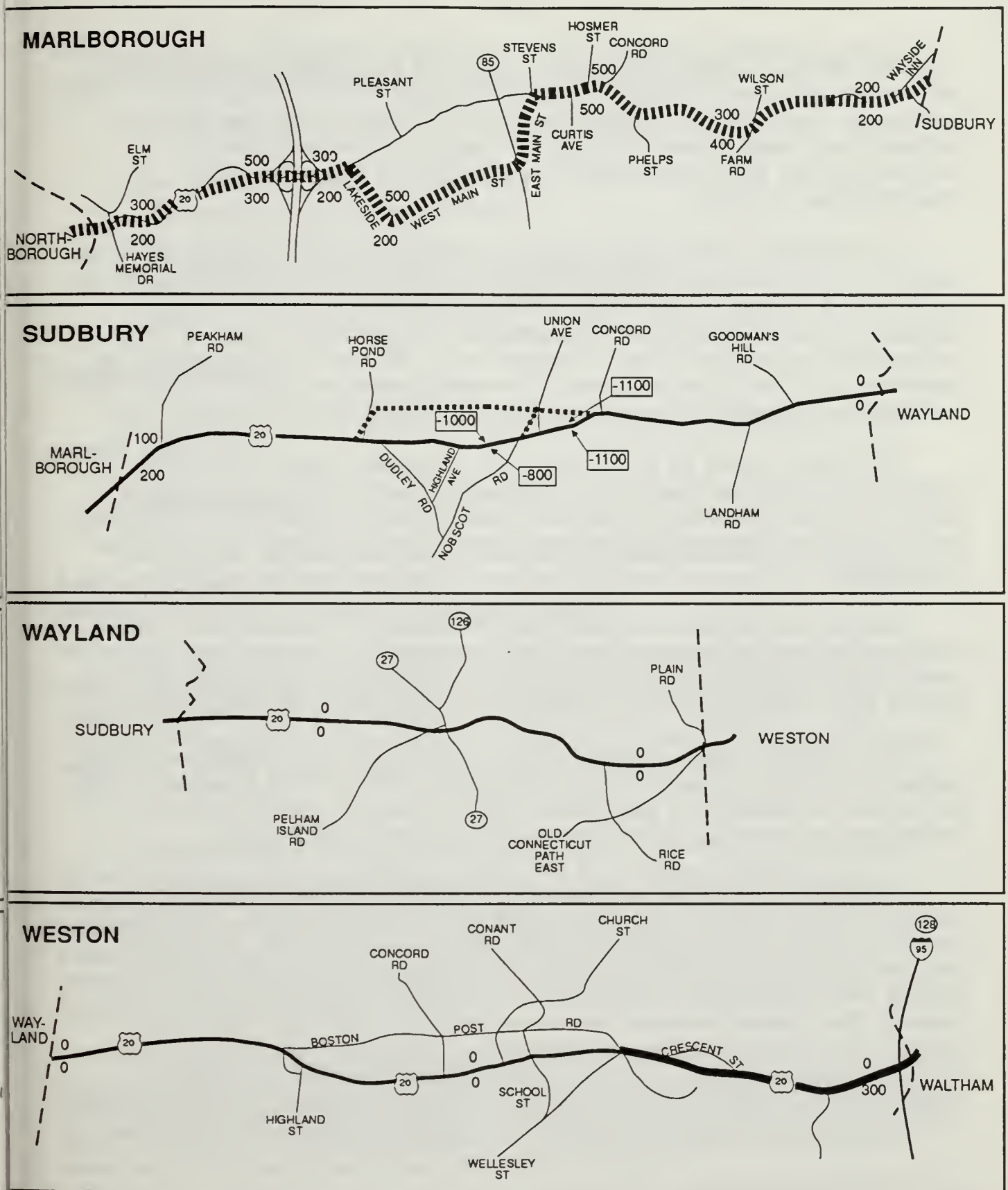


FIGURE 3-9
Selected Alternative 2
Traffic Volume Changes from No-Build, 2010 PM Peak Hour

and other studies, Marlborough, Sudbury, Wayland and Weston representatives have expressed interest in public transportation options to Boston and other subregional destinations to alleviate congestion on Route 20 and other highway facilities. As a result, a feasibility study of commuter rail service between Marlborough and Boston was recently completed by the Massachusetts Bay Transportation Authority.

For purposes of this study, analysis of transit alternatives concentrated on the feasibility of instituting bus transportation and commuter rail service from Sudbury and Wayland to Boston. The Sudbury/Wayland old dumping station was been suggested during the MetroWest Transportation Task Force meetings as a likely park-and-ride lot for feeder buses or express buses. For commuter rail service, the members of the Task Force suggested the re-establishment of MBTA commuter rail service through Sudbury, Wayland and Weston which was discontinued in 1971.

The target market for transit services is commuters traveling to Boston. Commuters traveling to Route 128 are destined for locations that are dispersed along the highway requiring a significant number of stops for each bus. In addition, the availability of free employee parking at work places, encourages the use of the automobile.

Boston was selected as the most likely destination to be examined for public transportation service because it has a high concentration of workers from each of the towns and a variety of transportation options (walking, rail transit, etc.) to serve the portion of the trip from the bus or commuter rail terminal to the employment site.

The 1980 U.S. Census Journey to Work data indicated that 14 percent (942) of Sudbury's workforce, 16 percent (961) of Wayland's workforce and 27 percent (1,396) of Weston's workforce were employed in Boston.[5] This pattern of attractions to Boston was confirmed by the 1987 traffic model developed for Route 20.

Ridership demand from Route 20 at the Sudbury/Wayland town line to Boston was estimated for express bus, feeder bus and commuter rail. The analysis was based on known public transportation ridership patterns from Marlborough, Sudbury and Wayland which are seen as the primary market for these services. Weston was excluded from consideration in the express bus calculations for two reasons: First, Weston residents receive excellent express bus and Green Line service at Riverside where they constitute about 12 percent of all express bus and Green Line riders. Second, a terminal at the Sudbury/Wayland town line is inconvenient for Weston residents, even to those with residences immediately east of Wayland. Access to the proposed park'n'ride lot at the Sudbury/Wayland line

---

[5]We found an error in the 1980 Journey to Work data for Marlborough. However, it is estimated that the proportion of workers who were employed in Boston in 1980 was approximately 3 percent of the Marlborough labor force or approximately 450 workers.

would necessitate commuters to "back-track" away from their destination, which is undesirable even when a faster travel mode would be available.

The following sources were used in the analysis:

-1980 US Census Journey to Work data
-1985 West Corridor Bus Survey Study
-1986 CTPS Green Line Count
-1978 Riverside Transportation Improvement Study
-1968 Commuter Rail Boardings by Station and by Origin Town

Service Alternatives

The following section describes and provides demand estimates for several service alternatives.

Express Bus Service

Description: **Express Bus service from the Wayland/Sudbury town line to Boston; free parking at the site; service every 15 minutes; a fare equal to or lower than that of Peter Pan service from Shoppers World.**

From the 1980 US Census, the commuter rail passengers from Marlborough, Sudbury and Wayland are 26, 50 and 22 respectively. Bus ridership is 77 from Marlborough, 167 from Sudbury and 148 from Wayland. Finally, Green Line ridership at Riverside is 9 from Sudbury and 21 from Wayland. Therefore, the best estimate of the total public transportation ridership from the three towns to Boston is 520.

Approximately 80 percent of commuter rail and express bus trips are work-related, therefore, it is assumed that the 520 trips from Sudbury, Wayland and Marlborough take place during commuting hours or between 6:30 and 9:30 AM. Of these 50 percent occur during the morning peak hour and 90 percent have Boston as a destination (as opposed to towns in the direction of Boston, such as Newton, Brookline, etc.). These factors reduce the total existing public transportation demand to 234 peak hour commuters.

It is estimated that the express bus time from the Sudbury/Wayland town line to Copley Square would be 45 to 50 minutes.[6] To estimate total trip time an additional 20 minutes should be added to reflect the average time it takes riders to reach the lot. With 15-minute headways and a 50-minute travel time to Boston, such a service would require the use of four buses during the peak hour.

---

[6]Based on travel time runs by CTPS.

From the description of existing public transportation service in Section 2.3, it is evident that a number of competitive public transportation options are already available at a shorter distance than the proposed park-and-ride lot site to approximately half of Sudbury's and Wayland's population. It is estimated that north Sudbury's proximity to the commuter rail in Concord and south Sudbury's proximity to the commuter rail and express bus in Framingham could limit Sudbury's participatory share by as much as 50 percent. Similarly, 40 to 50 percent of Wayland's commuters may be diverted to the Framingham express bus and the commuter rail in Natick and West Natick. It is estimated that 50 to 60 percent of Marlborough's bus commuters could be attracted to the park-and-ride facility. Finally, considering the geographic distribution of the commuters, it is estimated that there is the potential for approximately 120 commuters to shift to the new service.

As a rule of thumb, transit analysts assume that 75 percent of the demand for a new transit service comes from commuters already using some other form of public transportation. Conversely, an estimated 25 percent of the ridership of the new service will be new transit users. Therefore, the total estimated ridership of express bus service to Boston would be 160.

Feeder Bus Service

Description: **Feeder buses would run between the Sudbury/Wayland town line lot and Riverside with stops in Wayland and Weston; parking at the boarding site would be free; buses would depart every 15 minutes; ride fare would be moderate or free.**

This service would be less attractive than any of the existing alternative services for most public transit users from the three towns. The reason for this is the need to transfer twice (and possibly three times if one has to use rail transit at the Boston end of the trip), first to the feeder bus and then to the Express Bus or Green Line at Riverside. Also, it is unlikely that a major portion of the Weston commuters would use a feeder bus service. Apparently most of the Riverside commuters from Weston are from south of Route 20. In general, commuters prefer to travel in the direction of their final destination and, in this case, they would be more apt to drive or even walk south to Route 30 to reach Riverside instead of driving north to Route 20 to use the bus. Therefore, it was assumed that the major market for this service would be Riverside commuters from Wayland, Sudbury, and, to a lesser extent, Weston.

According to the CTPS 1985 West Corridor Bus Service study, 36 commuters from Sudbury, 54 from Wayland and 91 from Weston boarded express buses at

Riverside between 6:30 and 9:30 in the morning. Also, from Greenbine counts,[7] 100 commuters from Sudbury, Wayland and Weston board the Green Line during the morning peak period.

On this basis, the total potential peak period market for a feeder bus service would be 281 riders. From the literature, it has been established that mature bus service feeding to rapid transit stations accounts for 25 percent of the rapid transit boardings.[8] The remaining 75 percent arrive at the rapid transit station by other modes. Therefore, this factor reduces the potential feeder bus ridership to about 70 of which 35 are expected to ride during the peak hour. With 15 minute headways, there would be, on the average, nine riders per bus. With a round trip to Riverside of 52 minutes, four buses would be required during the peak hour.

Commuter Rail

Description: **Institute service along the abandoned MBTA line through east Sudbury, Wayland and Weston, known as the Central Mass. Branch of Boston & Maine Railroad[9] connect to the Fitchburg line in Weston.**

Regardless of demand for this service, it should be mentioned that restoration of the line would be very expensive. The base would have to be reconstructed and the tracks replaced for the entire length of the line. Also, an appropriate location for the connection with the Fitchburg line would have to be identified, designed and constructed. In order to fully examine the costs and benefits of a possible reactivation, the MBTA would conduct a feasibility study.

Commuter Rail ridership to Boston has grown dramatically between 1980 and 1989. For example, on an average weekday, the number of inbound passengers on the Fitchburg line grew from 1,960 to 2,838 or by 45 percent.[10] However, the growth occurred nearer the outer end of the line while boardings at stations in the study area remained flat during the same nine year period.[11] This is demonstrated in the following table.

---

[7]According the CTPS 1986 Green Line Counts, a total of 612 riders boarded the Green Line at Riverside in the morning peak period. Of these, according to an earlier CTPS study, 1.4 percent were from Sudbury; 3.4 percent were from Wayland and 11.5 percent were from Weston for a total of 100 riders.

[8]According to a 1972 CTPS study at Quincy Center.

[9]See Appendix for historical information.

[10]"Commuter Rail Patronage and Parking Estimate", June 9, 1988, CTPS Memo to the MBTA.

[11]"Kendall Green Commuter Rail Station Parking Demand Estimate", February 6, 1990, CTPS Memo to the MBTA.

TABLE 3-5
Commuter Rail Boardings at the Fitchburg Line Study Area Stations

Station	1980	1983	1986	1988	1989
Kendall Green	104	101	99	117	108
Hastings	31	23	7	6	25
Silver Hill	13	-	8	15	11
Lincoln	250	237	199	251	249

Commuter rail boardings from Sudbury, Wayland and Weston have also been rather stable since 1968. In 1968, the number of boardings from the three towns was 42, 57 and 91 respectively.[12] In 1980, according to the US Census, they were 50, 22 and 74.

According to evidence presented in the previously referenced CTPS memorandum, the lack of growth in transit ridership from Sudbury, Wayland and Weston has not been caused by a lack of transit supply or quality. The following factors would indicate that this low growth trend will continue into the future:

- Lower growth in the proportion of residents from the study area towns working in downtown Boston than from other towns further away from Boston. For example, it is projected that the number of Weston residents working downtown will increase 16 percent by 2010. The same figures for Concord and Acton are 40 and 55 percent.

- It is forecast that by 1995 highway travel time from Wayland and Weston will increase by 3 percent while that for Lincoln, Concord and Acton will increase by 8 percent.

- Weston, Wayland and Sudbury populations are expected to remain stable through 1995.[13]

From the above, demand for commuter rail by residents of the study area is not likely to increase sufficiently in the near future to justify the reopening of the abandoned Central Mass. Branch of the MBTA. Furthermore, any unforeseen demand could easily be accommodated by other commuter rail stations in the area.

[12]1968 Commuter Rail boardings by station and town of origin

[13]Metropolitan Area Planning Council.

Residents from north Sudbury, north Wayland and north Weston could easily be absorbed by stations in Concord and Lincoln. Residents from south Sudbury and south Wayland could use stations of the Framingham line. Also, in the event that the Framingham line is extended to Marlborough or Worcester, or the Saxonville site in Natick, there will be an even greater number of commuter rail options.

In addition to the ridership analysis presented above, an analysis of travel paths and origins and destinations from the Route 20 traffic model can reveal the potential for park-and-ride usage at the proposed site. The model revealed that the majority of Boston bound commuter trips, after using state and town roads, travel on the Massachusetts Turnpike for part of the trip to Boston.[14] However, very few of the Turnpike trips to Boston cross the Sudbury/Wayland town line on Route 20, one potential site for a park-and-ride lot. This indicates that Boston bound Turnpike trips utilize alternate routes, leaving Route 20 prior to reaching this point. Actually, it was found that of the trips travelling past this location, 60 percent have origins and destinations within study area towns. The remaining 40 percent are exchanges between Sudbury and Wayland and, external points north of Route 20.

3.5.4 Identification of Preferred Alternatives

On November 26, 1990, at the regular monthly meeting of MetroWest Transportation Task Force, the results of the detailed analysis of selected alternatives 1 and 2 were presented. The purpose of the presentation was to provide the Task Force representatives with the information needed to facilitate the identification of a list of preferred alternatives for the Route 20 corridor. Following the presentation, the Task Force representatives decided to finalize their positions in a subsequent committee meeting and produce a letter recommending a series of long-range actions. The letter is displayed in Figure 3-10.

The stated purpose of the letter was to offer comments on the proposed Draft Long Range Element of the Route 20 Corridor Study that would be useful in finalizing the study. The first, and potentially most important, comment made by the Task Force supports the long range objective for a Route 20 that balances land use and road capacity. The primary objective of the Task Force is to maintain and improve the character of the road as a "suburban-rural two-lane arterial" for the foreseeable future. Consequently, the Task Force recommends that sufficient land use controls be in place prior to the investment of public resources in any major improvements, such as the four-lane treatment in Marlborough and the Sudbury Village Bypass. This recommendation is supported by the results of the technical analysis which concludes that the final two alternatives analyzed provide minimally acceptable traffic conditions through 2010. This conclusion assumes that actual land use characteristics do not differ substantially from those used in the study.

---

[14]Sudbury, which has the minority of its downtown trips on the Turnpike is the exception. A major portion of its downtown-bound workers could be using the Route 2 corridor.

Growth Management Committee
13 East Central Street
Natick, MA 01760
508•651•7350

December 4, 1990

Mr. Bill Steffens
Manager, Analysis & Design
CTPS
Ten Park Plaza
Boston, MA 02116

Dear Bill,

The MetroWest Transportation Task Force met with CTPS staff on November 20, 1990, and in committee on November 26, 1990, to consider final recommendations for long range plans for the Route 20 corridor. It appears that the corridor study is nearing completion and MetroWest would like to take this opportunity to express its sincere appreciation for the sustained, thoughtful attention devoted to Route 20. The Task Force has been particularly pleased with CTPS' "bottoms up" locally derived approach to the study throughout the process and we believe that there is significantly greater potential for implementation of the plan due to this approach.

At this time, the MetroWest Transportation Task Force offers the following comments on the proposed Draft Long Range Element of the Route 20 Corridor Study. Our comments may be useful in guiding the finalization of the study so that it may be circulated more broadly in Route 20 communities for local review and comment.

MetroWest supports a long range future for the Route 20 corridor that brings land uses into balance with the capacity of Route 20. This concern derives directly from the MetroWest Growth Management Traffic Policies. Therefore, MetroWest strongly supports the enactment and enforcement of land use controls in corridor communities that will promote the long term capacity of Route 20 and assure the continuation of its predominant character as a suburban-rural two-lane arterial. The Task Force believes that such alternative land use controls should be in place prior to investments of public resources in major improvements identified in the corridor study, such as the four-lane treatment of Route 20 in Marlborough and the Sudbury Village Bypass.

(cont.)

FIGURE 3-10
MetroWest Transportation Task Force,
Response to November 20, 1990 CTPS Presentation

Mr. Bill Steffens, Page 2
December 4, 1990

Assuming action is taken to control land use, the MetroWest Transportation Task Force supports the concepts identified in the Route 20 Corridor Study for long range improvements to the corridor.

Road Segments: The Task Force supports a predominantly two-lane treatment of Route 20 road segments. The Task Force supports four-lane treatment only within the City of Marlborough, and three-lane (two lanes eastbound) treatment in Weston, east of Wellesley Street. (Support is based on the assumption that additional pavement will not be required.) The Task Force would not support extension of the multiple lane treatment beyond these two segments.

Intersections: The Task Force supports limited intersection improvements, as presented in Figures of the Draft Information packet distributed to the Task Force on November 20, 1990. The Task Force notes that the Build with Improvements options are incomplete to date and that improvements to other intersections will be presented in the draft final report.

Marlborough: The Task Force requests that all improvements assumed in the base case be clearly identified, either through a detailed verbal description or preferably through figures similar to those in the Draft Improvement Plan. Further, the Task Force requests that the study include an analysis of conditions at Lincoln/Stevens with left turns prohibited from eastbound Lincoln Street to northbound Stevens Street.

Sudbury: The Task Force supports the Nobscot connector and two-lane Sudbury Village Bypass to achieve significant intersection improvements at Nobscot Road and Union Avenue. Further, the Task Force supports the eventual designation of the Bypass as Route 20 and the redesignation of the existing Route 20 as a local road.

The Task Force noted that Figure 7 should be amended to reflect the current bypass alignment that intersects Route 20 between Nobscot Road and Highland Avenue. In addition, Figure 5 and

Concord Road analysis in Table 4 may require modification because the Sudbury Town Engineer believes there is insufficient pavement width on Route 20 to accommodate an eastbound left turn lane,

(cont.)

FIGURE 3-10 (cont.)
MetroWest Transportation Task Force,
Response to November 20, 1990 CTPS Presentation

while the westbound left turn lane is unnecessary because left turns are prohibited at that location.

Wayland: The Task Force supports the conceptual improvement proposed for the Route 126/Route 20/Route 27 intersection. The Task Force identified serious concerns regarding the need for increased pavement to construct the improvement, because the intersection is subject to flooding. The Task Force believes that substandard lane widths may be necessary in order to limit additional impervious surfaces and retain existing sidewalks. The Wayland representative cited the need for the signal to accommodate an emergency override for fire and police.

Weston: The Task Force supports the concept of intersection improvements, but request further exploration of alternatives prior to selection of preferred improvements. The Task Force requests that Weston representatives and the CTPS study team meet to delineate a restricted turning movement alternative that reduces trips on Wellesley Street (for example: prohibit left turns at Wellesley Street and School Street and make Wellesley Street one-lane, one-way northbound).

The Task Force does not support the restricted turning movement alternative analyzed in Table 2 and shown in Figure 2 because it increases traffic volumes on Wellesley Street, which is currently not designed to safely handle the projected volumes (narrow pavement, no sidewalks, predominantly residential).

Demand Reduction: The Task Force strongly supports the concept of demand reduction in the corridor. The Task Force believes that a pilot park and ride facility at the Sudbury/Wayland town line (perhaps at the Sudbury landfill or the joint septage facility) should be explored. Such a facility could provide riders for Big W service or a location for car or vanpool origination.

In addition, the Task Force has identified the following sidewalks for inclusion in the plan.

Marlborough: Sidewalks on both sides of Route 20 and pedestrian actuated phases at all signals.

(cont.)

FIGURE 3-10 (cont.)
MetroWest Transportation Task Force,
Response to November 20, 1990 CTPS Presentation

Mr. Bill Steffens, Page 4
December 4, 1990

Sudbury: Sidewalks on both sides of Route 20 between Nobscot Road and Concord Road.

Wayland: Reinstate sidewalk on south side of Route 20 from the Weston town line to Russell's Garden Center or a park and ride lot, if established, and a pedestrian actuated phase at the Route 20/27/126 signal.

Weston: Sidewalks on both sides of Route 20 from Wellesley Street to Highland Street and a pedestrian actuated phase at the School Street signal.

The Task Force supported sidewalk designs that include a grass or landscaped buffer strip between the roadway and sidewalk pavement.

Thank you for the opportunity to comment on the plan at this time. We look forward to its completion, local review and ultimate implementation.

Sincerely,

Rosamond P. Delori
Director

RPD/mjf

cc: MetroWest Growth Management Committee
MetroWest Transportation Task Force
Efi Pagitsas

MWTT1126.M

FIGURE 3-10 (cont.)
MetroWest Transportation Task Force,
Response to November 20, 1990 CTPS Presentation

As for the Route 20 road segments, the Task Force supports a four-lane treatment in Marlborough, no change in Sudbury and Wayland, and re-striping the section in Weston between Wellesley Street and the Route 128 interchange as three lanes, (two lanes eastbound/one lane westbound, without widening the cross-section).

At intersections, the Task Force supports the concept of limited intersection improvements. These improvements would achieve the minimum necessary to maintain Level of Service C/D operating conditions under 2010 travel demand.

The letter also mentioned specific community support for the following actions:

Sudbury: the Nobscot Road extension;
the Sudbury Village bypass;
designation of the bypass as Route 20 and
re-designation of existing Route 20 parallel to the bypass as local.

Wayland: the conceptual improvement for the Route 20 at 126/27 intersection, including pre-emption for fire and other emergency vehicles.

The letter also contains a series of comments addressing specific concerns of the individual communities and points to be clarified in the draft report.

The town of Weston initially objected to an alternative that would restrict left turns at the School Street intersection due to the increased volume that would use Wellesley Street.

Under the heading of "Demand Reduction," the Task Force indicated strong support for action that would lead to reduced demand in the corridor. In particular, a recommendation was made to explore the possibility for a pilot park-and-ride facility at the Sudbury/Wayland line.

As a final recommendation the Task Force suggests that sidewalks be designed to include a grass or landscaped buffer between the sidewalks and pavement.

In addition, supplemental analyses were requested in the city of Marlborough for the Lincoln/Stevens streets intersection, and in the town of Weston at the Wellesley Street and School Street intersections. A follow-up meeting with the Weston representatives was also requested.

Working from these recommendations, additional analytic work was done on operational alternatives for the School Street and Wellesley Street intersections in Weston. This necessitated individual meetings with Task Force representatives

from Weston and Wayland to discuss the potential impacts of these options. That analysis is discussed below. The analysis results and community reaction to them is incorporated in the "Conclusions" and "Recommendations" sections of the report as a refinement to the Task Force recommendations made in the December 4, 1990 letter.

3.5.5 Additional Weston Options

Initially, after reviewing the results of the aforementioned alternatives, the MetroWest Transportation Task Force requested the exploration of two additional alternatives in the town of Weston prior to the selection of preferred improvements. These alternatives, which are intended to reduce the number of trips on Wellesley Street are (1) a one-way system on School and Wellesley Streets and portions of Old Boston Post Road and Church Street and (2) restricted turning movements on School and Wellesley Streets.

One-Way System

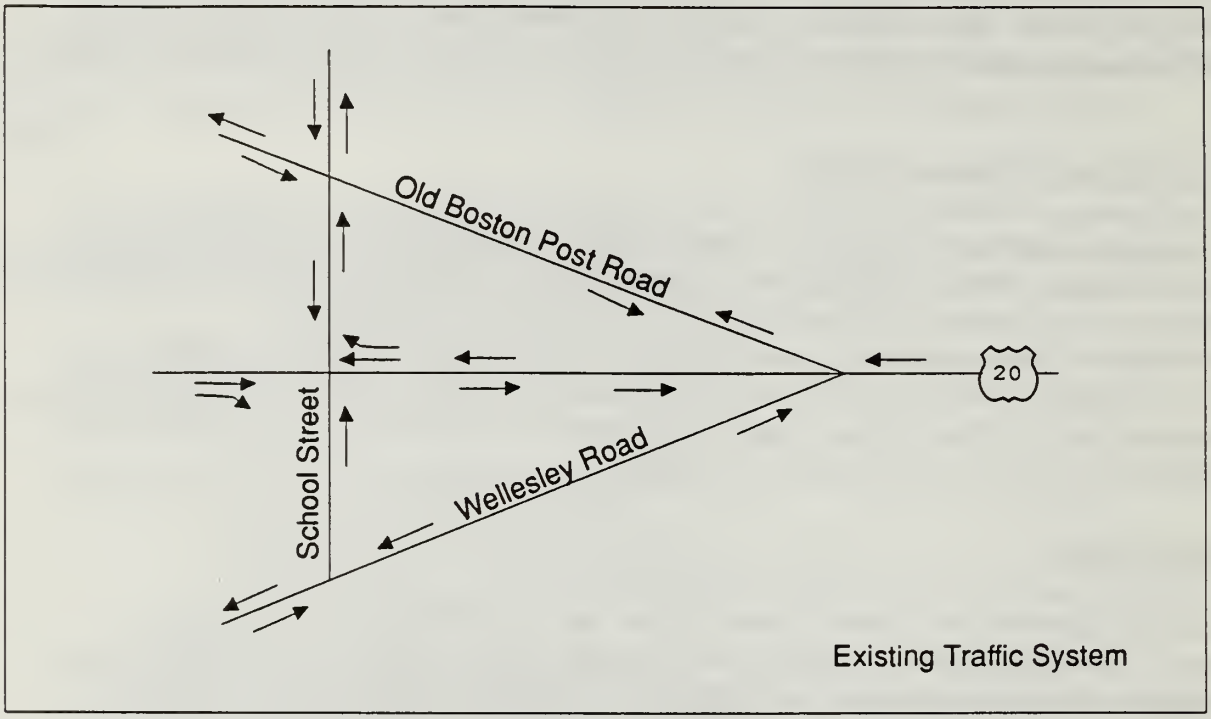
In this alternative, School Street is one-way southbound (two lanes); Wellesley Street is one-way northbound (one lane only) between the Wellesley Street/School Street intersection and Route 20; Old Boston Post Road is one-way westbound (two lanes) between Route 20 and Church Street; and Church Street is one-way southbound (two lanes) between Old Boston Post Road and Route 20 (see Figure 3-11).

Under this alternative, northbound P.M. peak hour traffic on Wellesley Street increases, however, the number of vehicles is still less than total two-way traffic in the 2010 No-Build alternative (see Figure 3-12). There is no appreciable change in the total volume on School Street, and no diversion of traffic from Route 20 to the one-way system. Northbound traffic increases on Summer Street; southbound traffic at Church Street increases from Route 128 and north/south road diversions. This alternative has no effect on surrounding communities.

Restricted Lefts at School and Wellesley Streets

This alternative prohibits westbound left-turns from Route 20 onto School and Wellesley Streets. It diverts traffic from Route 20 westbound (220 vehicles during the P.M. peak hour) to Route 128 southbound and significantly reduces southbound traffic on Wellesley Street (440 vehicles during the P.M. peak hour). Refer to Figure 3-13. There is an increase of 90 left-turns onto Highland Street in Weston and 160 left-turns onto Old Connecticut Path in Wayland (see Figure 3-14). These trips have destinations in Weston, Wayland, Natick, and Framingham, and were formerly made via lefts from Route 20 onto School and Wellesley Streets.

Of the 220 vehicles diverted from Rt. 20 westbound to Rt. 128 southbound, 51% will exit Rt. 128 at Rt. 30; 26% will exit at the Mass Pike; 19% will exit at Rt. 16;



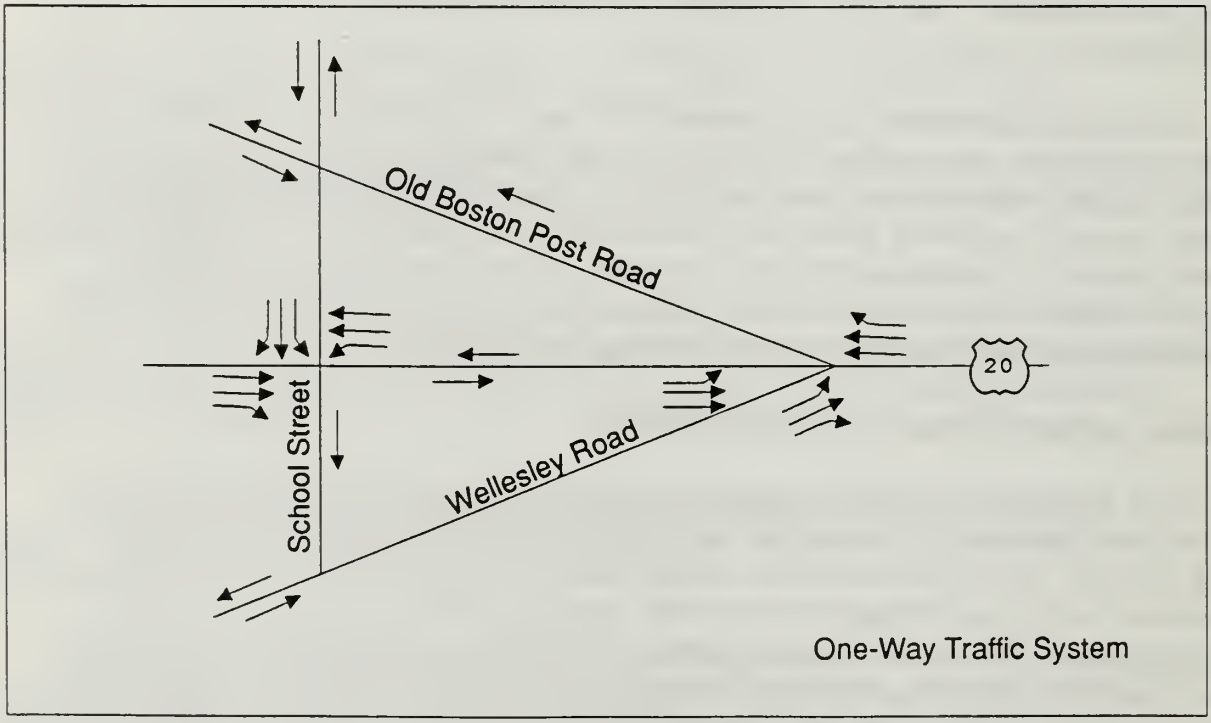


FIGURE 3-11
One-Way System in Weston

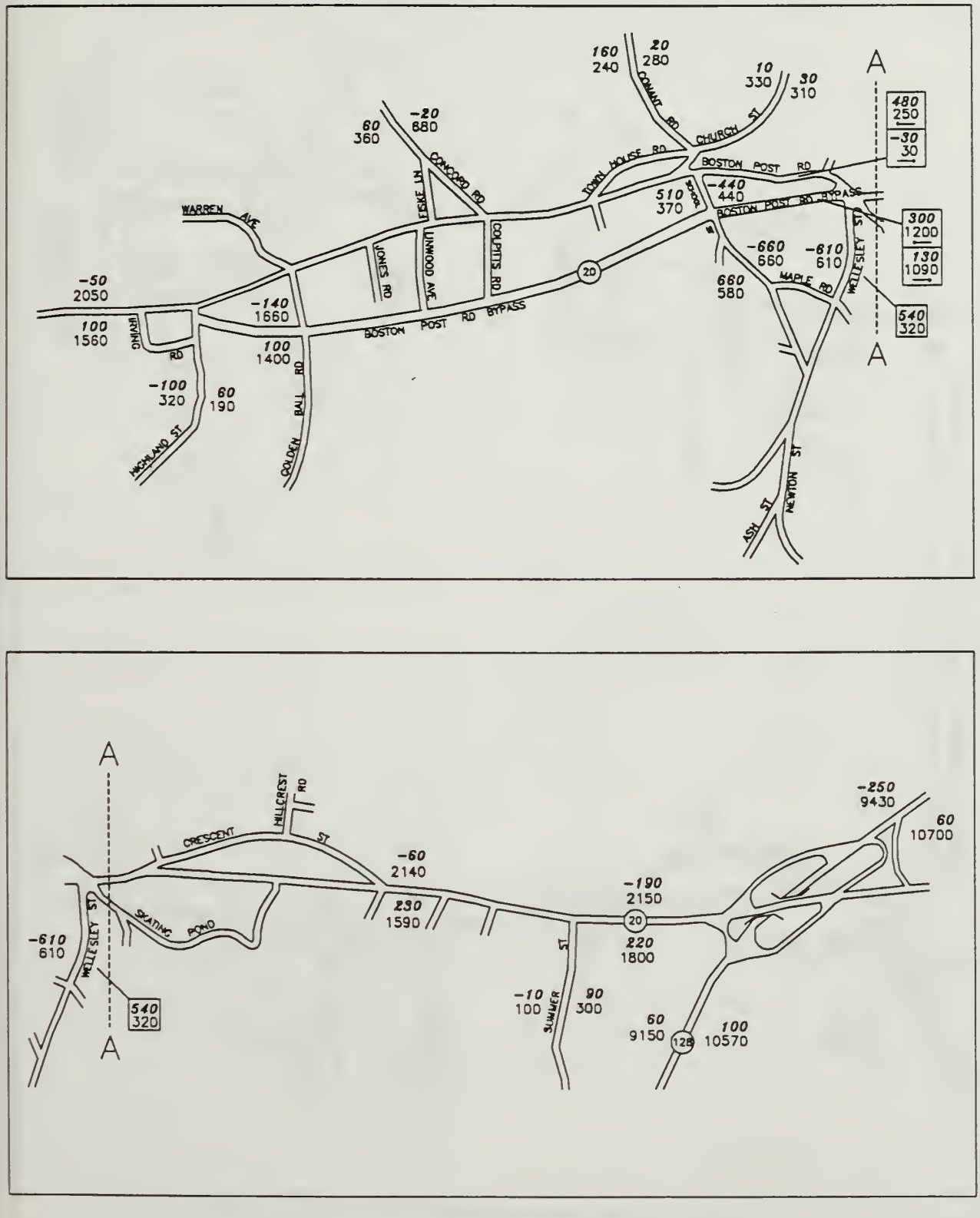


FIGURE 3-12
One-Way System Option in Weston
PM Peak Hour Volumes

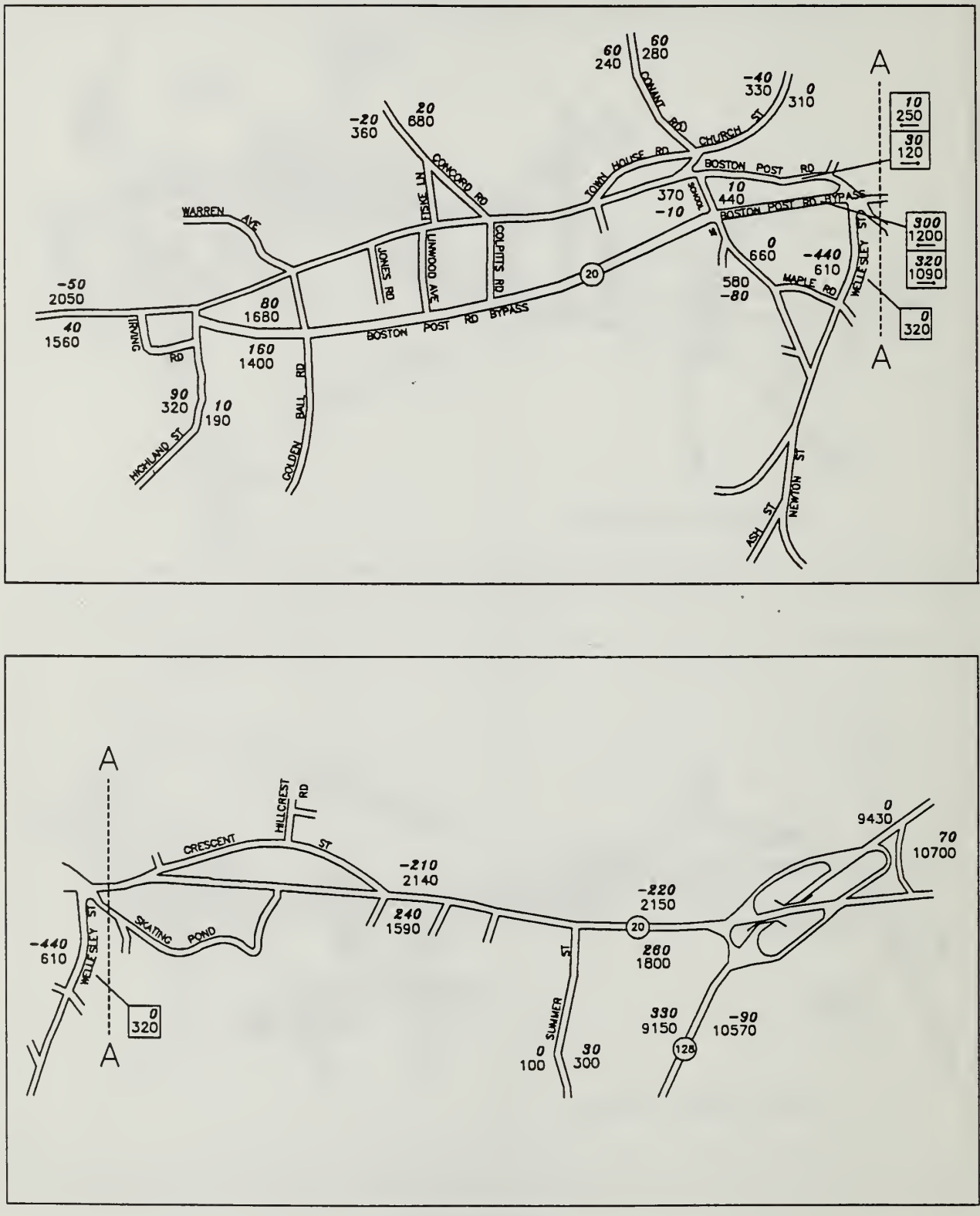


FIGURE 3-13
Restricted Left-Turn Option in Weston
PM Peak Hour Volumes

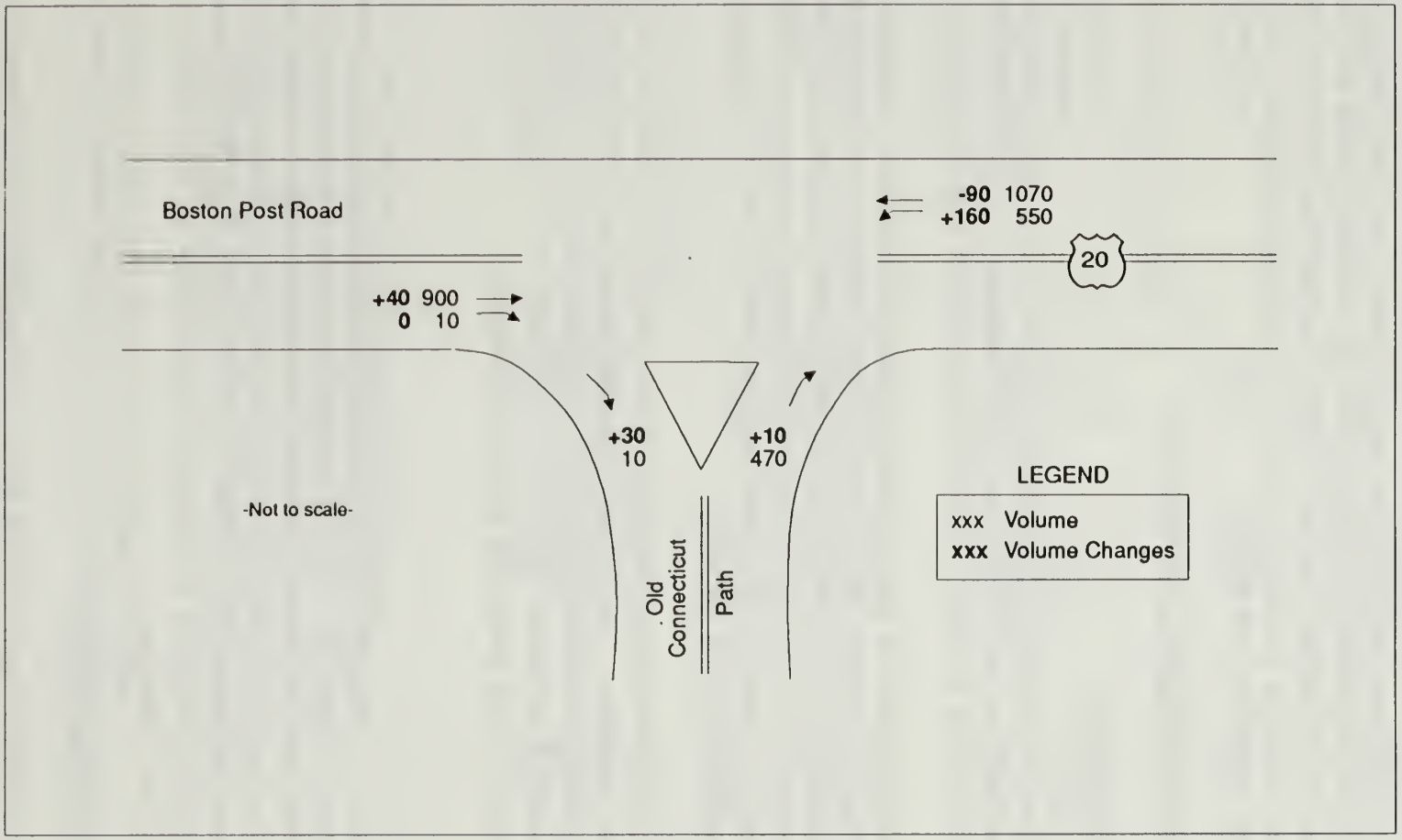


FIGURE 3-14
2010 No-Build PM Peak Hour Volumes and Volume Changes with Restricted Left Turns in Weston

and 4% will exit at Rt. 9. A majority of the additional traffic on Rt. 30 will enter Weston via rights onto River Road and Newton Streets and lefts onto Wellesley and Oak Streets. (Some of the left turns onto Wellesley and Oak Streets are destined for Wellesley.) Total volumes on Route 30 west of Wellesley Street are basically the same, however, the individual moves change. The vehicles diverted to the Mass Pike have destinations in Framingham and those exiting at Routes. 16 and 9 have destinations in Wellesley and Natick.

3.6 INTERSECTION LEVEL OF SERVICE

3.6.1 Analysis Results

As outlined in the existing conditions section of this report, the primary measure of the quality of traffic flow through a roadway corridor is the ability of the individual intersections to safely and adequately process a given volume of traffic.

In this section, each of the intersections that were tested under the 1987 existing conditions have been re-analyzed using the future year 2010 PM peak hour traffic forecasts developed for the No-Build and the two selected build alternatives outlined in Section 3.5. All intersection improvements or geometric changes that are assumed to be in place by 2010 have been included in this analysis and are outlined for each individual location.

Specific additional improvement options are also included in this section for several problem locations. Conceptual plans are presented which illustrate minimum requirements needed to achieve acceptable levels of service in 2010. Several areas such as wetlands, right-of-way and land use have been considered in the development of these plans and are also discussed.

Weston

A summary of the results of the capacity analysis for the four intersections in Weston is shown in Table 3-6. As can be seen from this table, the two build alternatives (four lanes on Route 20 in Marlborough and either a full by-pass or the Nobscot Road extension in Sudbury) will have very little effect on traffic operations along this section of the corridor. However, the existing capacity deficiencies at each of the following four locations will increase significantly by 2010 with the additional traffic volume that is forecast.

- **Route 20 at Summer Street**

This intersection was analyzed as an unsignalized T-type intersection with existing geometry. It is anticipated that the small amount of left turn traffic to and from Route 20 will continue to experience long delays in each of the 2010 scenarios. Channelization for these left turns would reduce the through traffic delay by

Route 20 @	NO BUILD	BUILD Alternative 1[a]	BUILD Alternative2[b]	BUILD w/ Improvement Options
Summer Street				
Route 20 WB left turns	E/64	E/64	E/64	NC
Summer Street NB	F/*	F/*	F/*	
Wellesley Street/Old Boston Post Road				
Route 20 EB left turns	F/120+	F/120+	F/120+	See Table 3-8
Route 20 WB left turns	F/120+	F/120+	F/120+	
Wellesley Street NB	D/39	D/39	D/39	
Old Boston Post Road SB	F/120+	F/120+	F/120+	
School Street (signalized)				
Route 20 EB left turns	F/120+	F/120+	F/120+	See Table 3-8
Route 20 WB left turns	F/120+	F/120+	F/120+	
School Street NB	F/120+	F/120+	F/120+	
School Street SB	F/120+	F/120+	F/120+	
Overall Intersection	F/120+	F/120+	F/120+	
Highland Street/Old Boston Post Road				
Route 20 EB left turns	F/*	F/*	F/*	See Table 3-8
Route 20 WB left turns	E/37	E/37	E/37	
Highland Street NB	F/*	F/*	F/*	
Old Boston Post Road SB	F/*	F/*	F/*	

KEY:
- X/XX — Level of service/delay in seconds (PM peak hour).
- F/* — Analysis equations not applicable at this level of delay. Drivers forced to accept unsafe gaps in traffic.
- F/120+ — Degree of failure beyond limits of analysis equations. Delay in excess of 120 seconds.
- NC — No change in the level of service calculated for these movements (see discussion in text).

[a]Four lanes on Route 20 in Marlborough and the Nobscot Extension in Sudbury.
[b]Four lanes on Route 20 in Marlborough and both the Full By-Pass and Nobscot Extension in Sudbury.

TABLE 3-6
Weston
2010 Levels-of-Service

removing left turning vehicles which block through traffic while waiting to turn. This improvement may be considered, however, no specific geometric changes to this intersection are proposed since the reductions in vehicle delay would not be significant.

The remaining three intersections are interrelated due to their close proximity:

- **Route 20 at Wellesley Street/Old Boston Post Road**
- **Route 20 at School Street**
- **Route 20 at Highland Street/Old Boston Post Road**

The Wellesley Street intersection was analyzed as a signalized intersection, based on the recommendations made in the Short Range report, optimal signal timing was assumed at School Street and no changes were assumed at Highland Street.

Because of the severity of the existing and future year problems in this section of the corridor, and the goal of the town to minimize roadway widening, several improvement options were considered for these three locations. Isolated intersection improvements, turn restrictions and a one way scheme were analyzed. Each intersection was also tested under these improvement options with both one and two through lanes on the Route 20 approaches. A summary of the results is shown in Table 3-7.

As can be seen from this table, in all of the options two through lanes are required for both of the Route 20 approaches at each intersection to achieve acceptable levels of service.

Several meetings were held with the MetroWest Transportation Task Force and representatives from the town of Weston to present this data and explain the results. From the discussion at those meetings, further variations of these schemes were requested as discussed in Section 3.5.5. An additional turning movement restriction scheme has also been analyzed with left turn prohibition from Route 20 both eastbound and westbound at Wellesley and School Streets. An analysis of two additional intersections, School Street at Wellesley Street and Church Street at School Street, is also included. A summary of the results is shown in Table 3-8 and Figures 3-15 through 3-17.

In each of these options, the improvements recommended would greatly improve levels of service along Route 20. However, as noted in Table 3-8, there are also some adverse issues with implementing each one. In all of the options, right of way takings along Route 20 will likely be required. Additional impacts of each option are:

	Wellesley Street	School Street	Highland Street
No Build	F/120+	F/120+	F/*†
Additional Isolated Improvements			
One through approach lane each direction	F/120+	F/120+	F/120+
Two through approach lanes each direction	B/12	D/27	C/20††
Restrict Turning Movements			
One through approach lane each direction	F/120+	F/120+	F/120+
Two through approach lanes each direction	C/19	D/25	C/19††
One Way Scheme			
One through approach lane each direction	F/120+	F/120+	F/120+
Two through approach lanes each direction	C/24	E/56	C/20

KEY: X/XX Level of service/delay in seconds (PM peak hour).
F/* Analysis equations not applicable at this level of delay. Drivers forced to accept unsafe gaps in traffic.
F/120+ Degree of failure beyond limits of analysis equations. Delay in excess of 120 seconds.

†Unsignalized intersection.
††LOS F/* if remains as an unsignalized intersection.

TABLE 3-7
Weston
2010 Levels-of-Service
Improvements Option

	Wellesley St.	School St.	Highland St.	Wellesley St.	School St.	Comments
No Build	F/120+	F/120+	F/*†	F/*†,‡	F/*†	Extremely poor LOS by 2010 without additional improvements.
Build Alternative 1 or 2[a] (With additional isolated improvements)	B/12	D/27	C/20††	C/17‡‡	D/35††	Largest amount of right-of-way of all options. Highest cost. Traffic signals probably warranted at all locations.
Restrict Turning Movements (No lefts from Route 20 WB to Wellesley Street and School Street)	B/10	B/12	C/18††	F/*†‡	D/32††	Reduces right-of-way requirements. Some redistribution of traffic.
Restrict Turning Movements (No lefts from Route 20 WB and EB to Wellesley Street and School Street)	B/10	B/12	C/19††	F/*†,‡	E/53††	Reduces right-of-way requirements. Approximately 100 additional Route 20 WB lefts at Highland Street.
One Way Scheme (One lane on Wellesley Street south of Route 20)	D/39	E/58	C/15††	‡‡‡	B/15††	Reduces right-of-way requirements. Local travel patterns altered. Marginal LOS levels on Route 20.

KEY: X/XX Level of service/delay in seconds (PM peak hour).
F/* Analysis equations not applicable at this level of delay. Drivers forced to accept unsafe gaps in traffic.
F/120+ Degree of failure beyond limits of analysis equations. Delay in excess of 120 seconds.

[a]Four lanes in Marlborough with either improvement option in Sudbury.
†Unsignalized intersection.
††LOS F/* if remains as an unsignalized intersection.
‡Wellesley Street SB - LOS F.
‡‡Signalized intersection.
‡‡‡No conflicting movements with this scheme.

TABLE 3-8
Weston
2010 Levels-of-Service
Additional Improvements Option

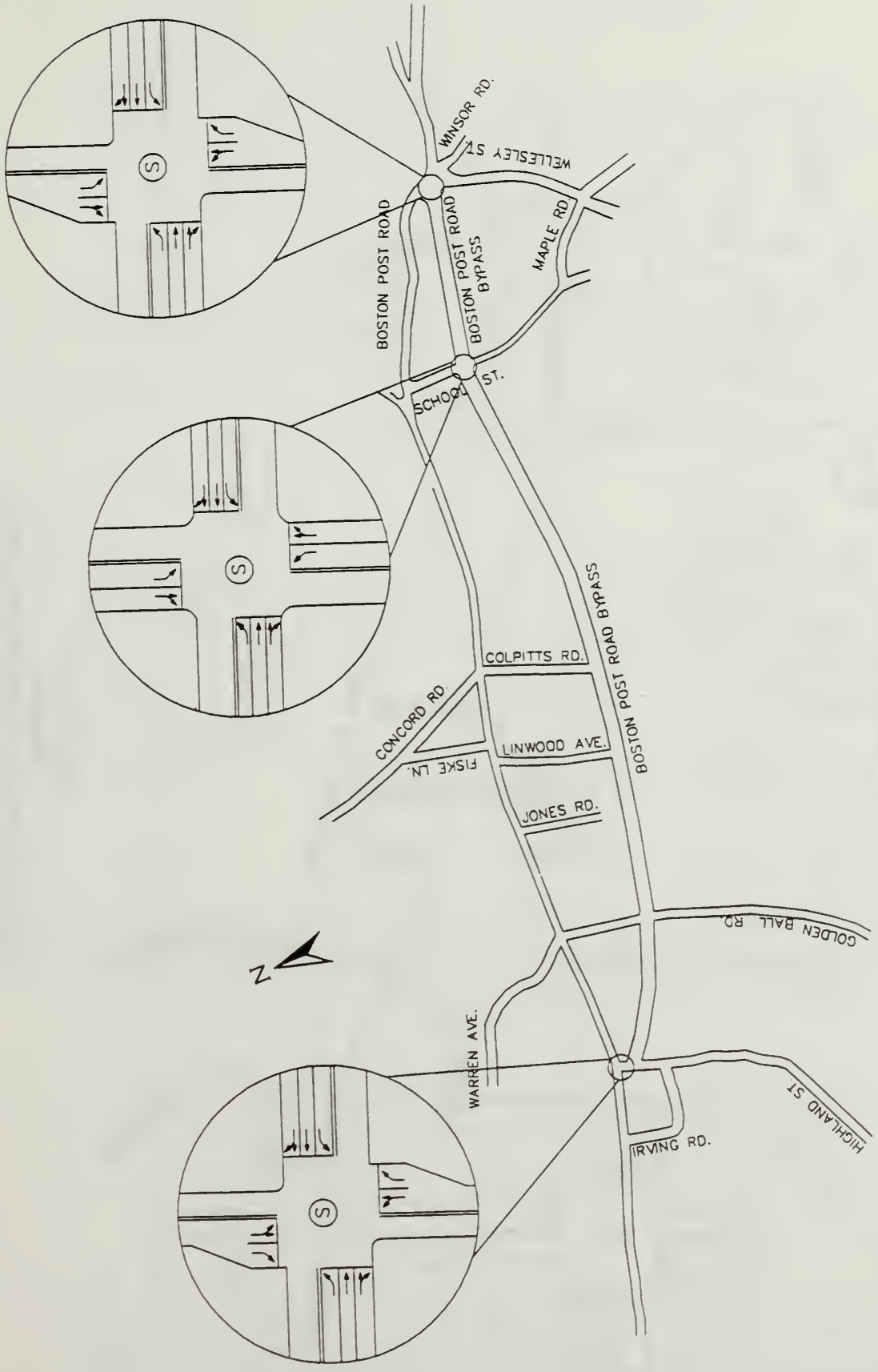


FIGURE 3-15
Weston
Isolated Improvements Option

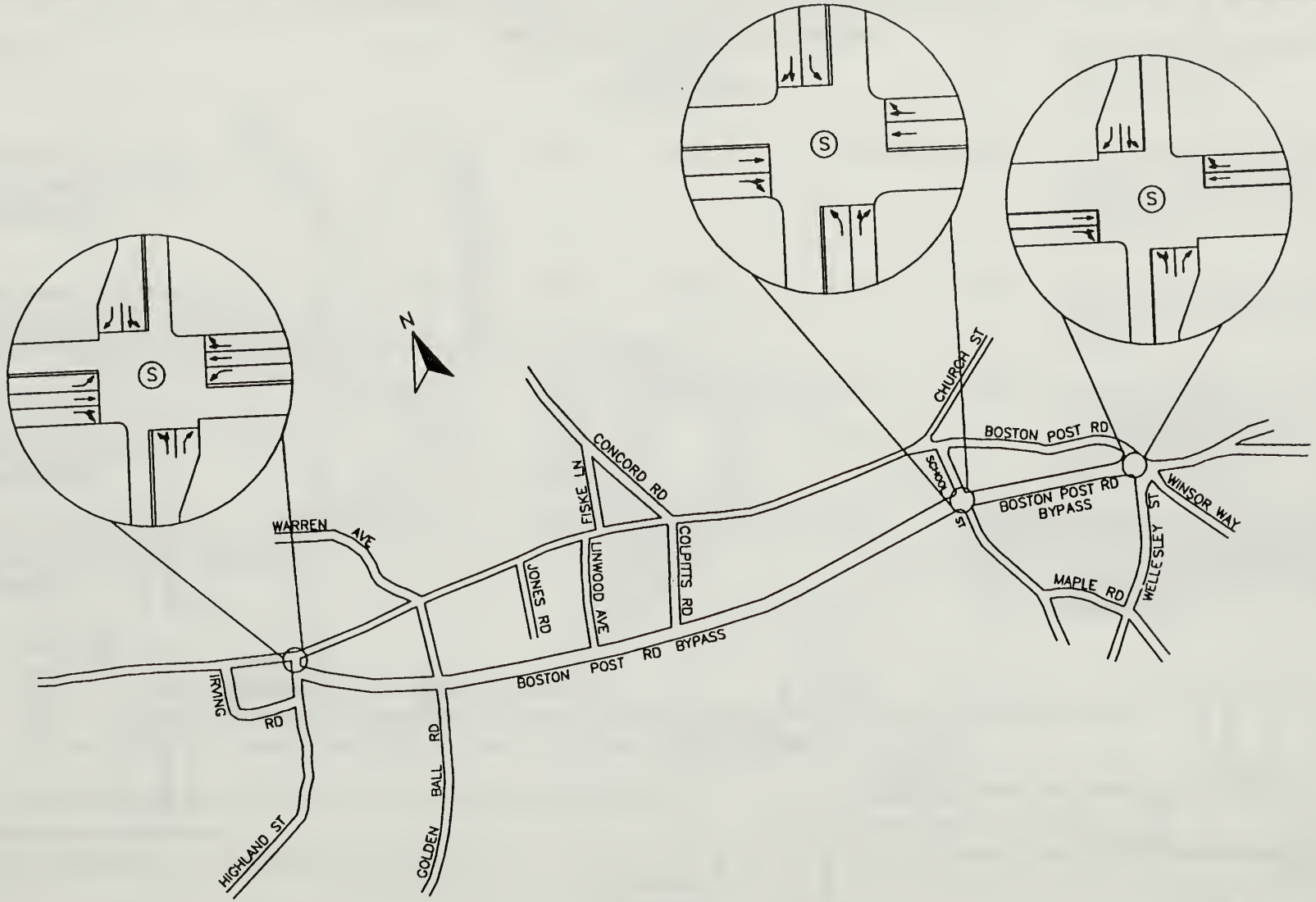


FIGURE 3-16
Weston
Turning Movement Restrictions Option

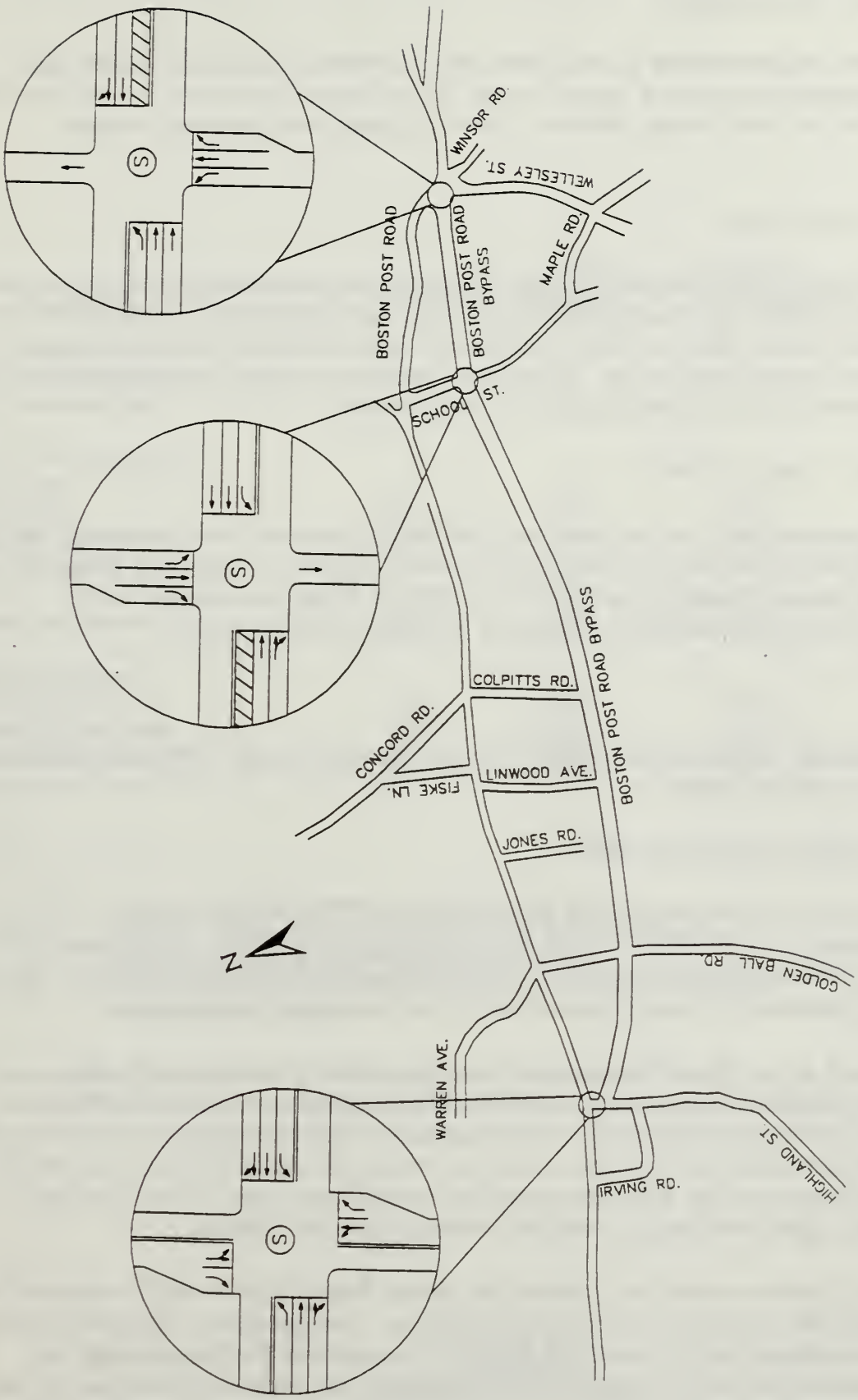


FIGURE 3-17
Weston
One-Way System Option

Signal Improvements

Isolated improvements at each intersection provide the most benefit and require the greatest amount of right-of-way. In addition, this option would have the least impact on the local travel patterns. Traffic signals are proposed at each location.

Turn Restrictions

Right-of-way requirements would appear to be minimized under the option of restricting turning movements both eastbound and westbound on Route 20 at Wellesley and School Streets. With both of the turn restriction options, some redistribution of traffic will occur. Additional left turns would be expected at Highland Street and Old Connecticut Path in Wayland.

Altering Travel Patterns

The proposed one way scheme reduces the right-of-way requirements, but it will have the negative effect of altering local travel patterns. Marginal levels of service would be expected at the Route 20 at School Street intersection while removing the delays at the School Street at Wellesley Street location.

Wayland

A summary of the results of the capacity analysis for the three intersections in Wayland is shown in Table 3-9.

- **Route 20 at Old Connecticut Path**

This location was analyzed as an unsignalized T-type intersection with existing geometry. By 2010, the delays incurred by turning traffic to and from Old Connecticut Path will become extreme. Existing queuing problems on Route 20 will also become worse with the additional traffic that is forecast for this area.

As noted in the Short Range report, the problems associated with this location are typical for intersections where side street traffic volumes are high relative to the major street volumes. The number of adequate gaps in the Route 20 traffic to provide sufficient time for safe turns will be minimal by 2010. Given the peak hour volumes on the side street and the insufficient gaps in the mainline traffic, a traffic signal will most likely be warranted at this location.

Figure 3-18 is a conceptual plan of the signal design that would be required to achieve acceptable levels of service at this location. The geometric changes include removing the existing traffic island on the Old Connecticut Path approach, two through lanes eastbound on Route 20 and a separate left turn lane westbound. All turns and potential conflict points are concentrated and are made under the signal

Route 20 @	NO BUILD	BUILD Alternative 1[a]	BUILD Alternative2[b]	BUILD w/ Improvement Options
Old Connecticut Path				
Route 20 WB left turns	F/*	F/*	F/*	See
Old Connecticut Path	F/*	F/*	F/*	Table 3-10
Routes 27/126 (signalized)				
Route 20 EB	C/19	C/19	C/19	D/33
Route 20 WB	F/61	F/61	F/61	D/35
Routes 27/126 NB	F/67	F/67	F/67	E/43
Routes 27/126 SB	F/84	F/84	F/84	E/51
Overall Intersection	E/55	E/55	E/55	D/40
Pelham Island Road				
Route 20 EB left turns	D/29	D/29	D/29	
Route 20 WB left turns	D/22	D/22	D/22	NC
Pelham Island Road NB	F/*	F/*	F/*	
Pelham Island Road SB	F/*	F/*	F/*	

KEY: X/XX Level of service/delay in seconds (PM peak hour).
F/* Analysis equations not applicable at this level of delay. Drivers forced to accept unsafe gaps in traffic.
NC No change in the level of service calculated for these movements (see discussion in text).

[a]Four lanes on Route 20 in Marlborough and the Nobscot Extension in Sudbury.
[b]Four lanes on Route 20 in Marlborough and both the Full By-Pass and Nobscot Extension in Sudbury.

TABLE 3-9
Wayland
2010 Levels-of-Service

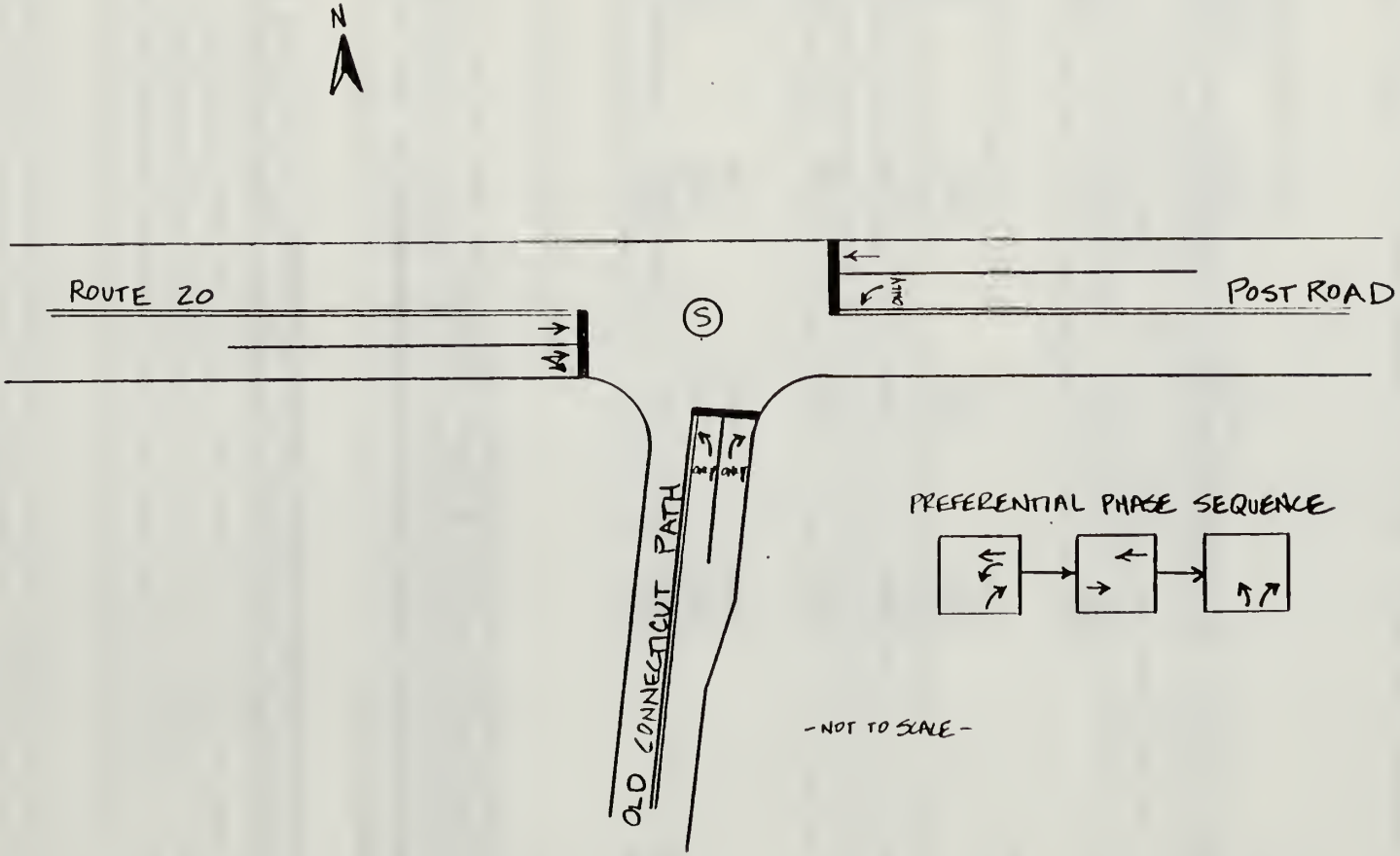


FIGURE 3-18
Wayland
Route 20 at Old Connecticut Path Road
Proposed Signal Operation

control. With this design, a level of service B would be expected at this location. Although some additional minimal delay to the Route 20 through traffic would be introduced with this signal, the overall intersection will function safer and more efficiently.

As outlined above, several improvement options have been considered for Route 20 in Weston. Some redistribution of traffic is expected with the two schemes that restrict turning movements at Wellesley and School Street. At the Old Connecticut Path intersection, an increase of approximately 160 Route 20 westbound left turns have been forecast for the PM peak hour. Some additional delay and queuing would also be expected for the Route 20 through traffic with these changes. However, the signal design that is proposed for the 2010 Base condition would be more than adequate to handle this additional traffic. No measurable effects on any of the other intersections in Wayland would be expected from these schemes. Results from this analysis are presented in Table 3-10.

- **Route 20 at Route 27/126**

Traffic signal modifications recommended in the Short Range report that included an exclusive left turn phase for the Route 27/126 approaches and optimal signal timing were assumed in the 2010 Base scenario. Although some improvement over the 1987 existing condition can be seen with these changes, traffic through this intersection would continue to experience unacceptable delays.

The heavy north/south demand on the minor Route 27/126 approaches combined with the high volume of traffic on Route 20 limit the number of viable improvement options for this intersection. While some benefits could be achieved by signal retiming, roadway widening is required to adequately address the capacity deficiencies. However, the physical layout of this intersection also poses several constraints. These include wetlands in the southwest and northeast quadrants, limited right-of-way and the acute angle formed by the Route 20 approaches. The Town of Wayland requested that in any redesign of this intersection each of these constraints be considered and that safe pedestrian crossings also be accommodated at this location.

A conceptual plan of one improvement option for this intersection is shown in Figure 3-19. As part of this design, it is proposed that Route 20 be widened at the intersection to one through/right lane and one through/left lane in the eastbound direction and one through/left lane, one through lane and one exclusive right turn lane in the westbound direction. Two receiving lanes are provided with adequate tapering back to one lane in each direction. A fully actuated signal controller is included with exclusive pedestrian phase capabilities.

The geometry that is proposed is the minimum configuration that is needed to achieve an acceptable level of service D and address pedestrian safety at this

	Route 20 @		
	Old Conn. Path	Routes 27/126	Pelham Is. Road
No Build	F/*†	E/55	F/*†,‡‡
Build Alternative 1 or 2[a] (With additional isolated improvements)	B/10	D/40	F/*†,‡‡
Restrict Turning Movements (No lefts from Route 20 WB to Wellesley Street and School Street)	C/17‡	D/40	F/*†,‡‡

KEY: X/XX Level of service/delay in seconds (PM peak hour).
F/* Analysis equations not applicable at this level of delay. Drivers forced to accept unsafe gaps in traffic.

[a]Four lanes in Marlborough with either improvement option in Sudbury.
†Unsignalized intersection.
‡An increase from the Build scenarios of approximately 160 Route 20 WB left turns. Route 20 EB LOS declines from B/14 to D/27 in this scenario.
‡‡Provide separate turn bays where appropriate. Turns channelized but remain at LOS F.

TABLE 3-10
Wayland
2010 Levels-of-Service
with Turning Movement Restrictions Option in Weston

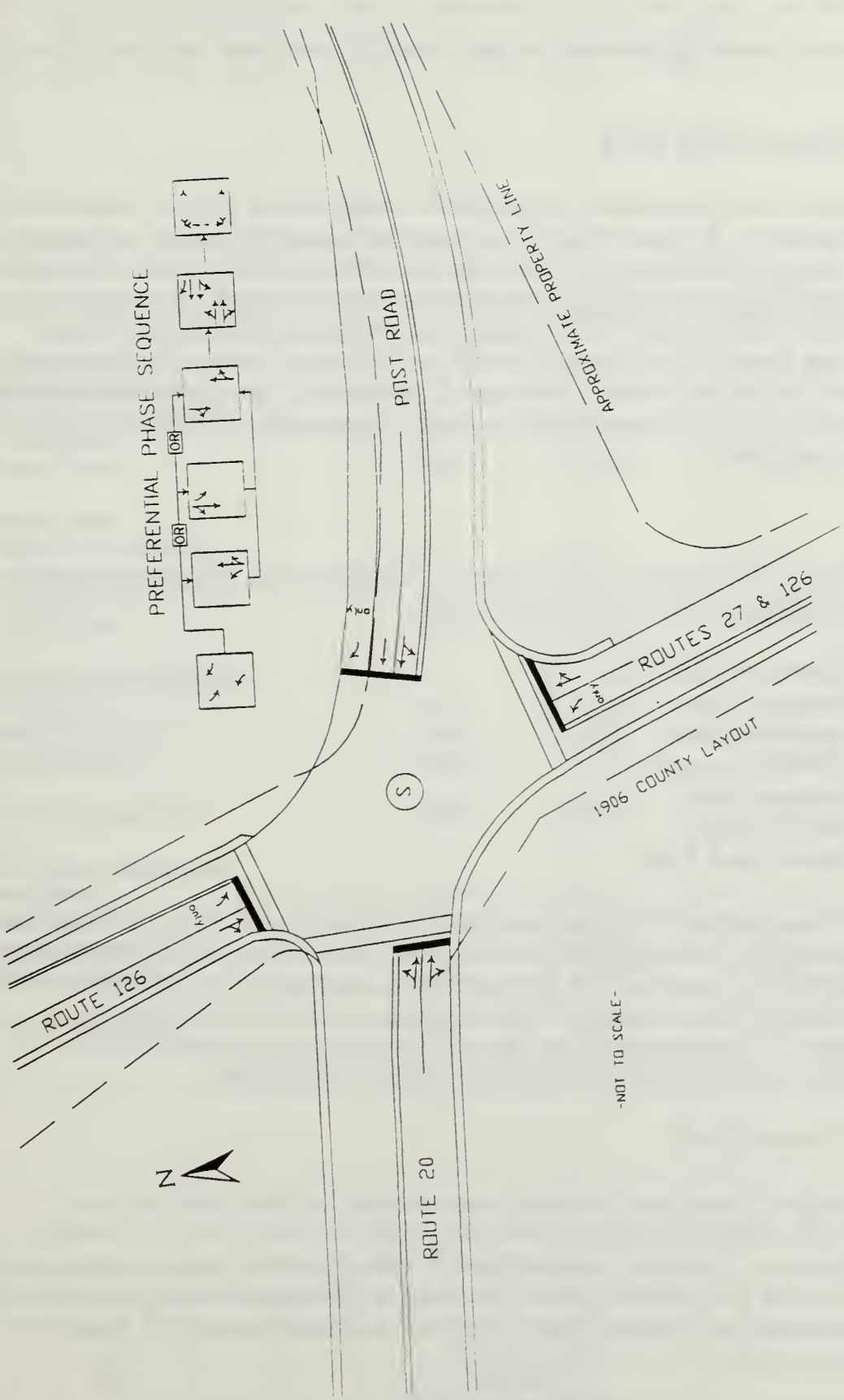


FIGURE 3-19
Wayland
Route 20 at Routes 27/126
Proposed Signal Operation

location. However, some right-of-way takings would be required with this Route 20 cross-section.

- **Route 20 at Pelham Island Road**

This location was analyzed as two separate unsignalized T-type intersections with existing geometry. Pelham Island Road was considered the minor approach for both analyses. Because the effect of a traffic signal at Route 27/126 is not considered in the unsignalized analysis method, the level of service reported for the moderate amount of left turn traffic to and from Route 20 is somewhat misleading. Gaps introduced by this signal in the Route 20 traffic would allow turns to be made with much less delay than is calculated. Although channelizing these movements out of the through traffic should be considered, no specific geometric changes to this intersection are proposed.

Sudbury

A summary of the results of the capacity analysis for the following seven intersections in Sudbury is shown in Table 3-11.[15]

- **Route 20 at Goodman Hill Road**
- **Route 20 at Concord Road**
- **Route 20 at Landham Road**
- **Route 20 at Union Avenue**
- **Route 20 at Nobscot Road**
- **Route 20 at Dudley Road**
- **Route 20 at Horse Pond Road**

Each of these intersections were analyzed as unsignalized T-type intersections with existing geometry. Although left turns to and from Route 20 will continue to experience long delays in each of the 2010 scenarios, no specific improvements have been recommended at these locations. Signalization would not be warranted or necessarily desired. Channelization for these movements to separate them out of the total approach traffic should be considered where appropriate.

- **Route 20 at Concord Road**

Optimal signal timing and phasing were assumed at this location with existing geometry. With this change, some improvement from the 1987 existing condition can be seen. However, unacceptable levels of service would continue to be expected in each of the 2010 scenarios. The existing design of this signal does not include channelization or separate phasing for the moderate amount of Route 20 eastbound left turn traffic.

---

[15]The level-of-service analysis for Sudbury reflects the full alignment of the Bypass.

Route 20 @	NO BUILD	BUILD Alternative 1[a]	BUILD Alternative2[b]	BUILD w/ Improvement Option
Goodman Hill Road				
Route 20 EB left turns	F/*	F/*	F/*	
Goodman Hill Road SB				
- left turns	F/*	F/*	F/*	NC
- right turns	E/97	E/97	E/97	
Landham Road				
Route 20 WB left turns	F/*	F/*	F/*	
Landham Road NB				NC
- left turns	F/*	F/*	F/*	
- right turns	E/38	E/38	E/38	
Concord Road (signalized)				
Route 20 EB	F/94	F/94	F/94	C/15
Route 20 WB	E/42	E/42	E/42	D/28
Concord Road SB	F/120+	F/120+	F/120+	F/70
Overall Intersection	F/79	F/79	F/79	D/27
Union Avenue (signalized)				
Route 20 EB	D/32	A/3	A/2	
Route 20 WB	D/30	A/3	A/2	NC
Shopping Center NB	E/44	C/21	C/16	
Union Avenue SB	E/43	C/16	C/16	
Overall Intersection	D/34	A/5	A/5	

(cont.)

TABLE 3-11
Sudbury
2010 Levels-of-Service

Route 20 @	NO BUILD	BUILD Alternative 1[a]	BUILD Alternative2[b]	BUILD w/ Improvement Option
Nobscot Road				
Route 20 EB	F/113‡	C/24##	A/5(LT)###	
Route 20 WB	E/43	B/13	A/4(LT)	NC
Nobscot Road NB	F/120+	D/34	D/36(LT)	
Nobscot Extension SB	-	D/25	C/17(LT)	
Overall Intersection	F/84	C/22		
Dudley Road				
Route 20 WB left turns	C/17	C/18	A/5	NC
Dudley Road NB	F/*	F/*	D/21	
Horse Pond Road				
Route 20 EB left turns	D/18	D/19	D/21	NC
Horse Pond Road SB	F/*	F/*	F/*	

KEY:

X/XX	Level of service/delay in seconds (PM peak hour).
F/*	Analysis equations not applicable at this level of delay. Drivers forced to accept unsafe gaps in traffic.
F/120	Degree of failure beyond limits of analysis equations. Delay in excess of 120 seconds.
NC	No change in the level of service calculated for these movements (see discussion in text).
LT	Left turns.

[a]Four lanes on Route 20 in Marlborough and the Nobscot Extension in Sudbury.
[b]Four lanes on Route 20 in Marlborough and both the Full By-Pass and Nobscot Extension in Sudbury.
‡Signalized 3-way intersection with short range improvements.
##Signalized 4-way intersection with proposed geometry.
###Unsignalized 4-way intersection with proposed geometry.

TABLE 3-11 (cont.)
Sudbury
2010 Levels-of-Service

One option for improving this location is shown in Figure 3-20. By channelizing the left turns on Route 20 out of the through traffic and providing separate preferential phasing, acceptable levels of service could be achieved. A provision for the westbound left turns into the business located to the south of Route 20 is also incorporated into this design. Similar results would be expected, however, if this movement was not allowed.

- **Route 20 at Union Avenue**

The Union Ave intersection was analyzed as a four way signalized intersection with existing geometry and optimal timing and phasing. Acceptable levels of service would be expected in the 2010 Base scenario. This intersection will function extremely well under both Build alternatives. The redistribution of most of the eastbound and southbound turns to the Nobscot Road extension will reduce the traffic through this intersection and simplify the operation of this signal.

- **Route 20 at Nobscot Road**

The Nobscot Road location was analyzed as an unsignalized T-type intersection in the 2010 Base scenario with existing geometry. Extreme delays are expected for each of the turning movements to and from Route 20. With the addition of the extension road to Union Avenue in either of the two Build scenarios, this location would become a four way intersection. Because of this change, a proposed design for this intersection was developed and is shown in Figure 3-21. Exclusive left turn lanes are provided on Route 20 both eastbound and westbound and exclusive right turn lanes are provided northbound and southbound.

Additional analysis was performed on these two Build schemes because of their immediate impact on this section of the Route 20 corridor. Figures 3-22 and 3-23 illustrate proposed geometry for each of the impacted intersections in this area. It should be noted that the signal that is proposed at Nobscot Road for the Nobscot extension scenario would not be required with the full by-pass.

Marlborough

A summary of the results of the capacity analysis for the six intersections in Marlborough is shown in Table 3-12. Four locations, Route 20 at Wayside Inn/Hager Street, Route 20 at Wilson Street/Farm Road, Route 20 at Hosmer Street and Route 20 at Lincoln Street/Stevens Street, are analyzed including specific geometric improvements assumed by 2010. These improvements, outlined below, will be implemented as part of the mitigation requirements for the development of the Indian Hill Park project and the Post Road Shopping Plaza. The two developers of these projects with the City of Marlborough have jointly committed to implement the improvements as outlined in the Massachusetts Department of

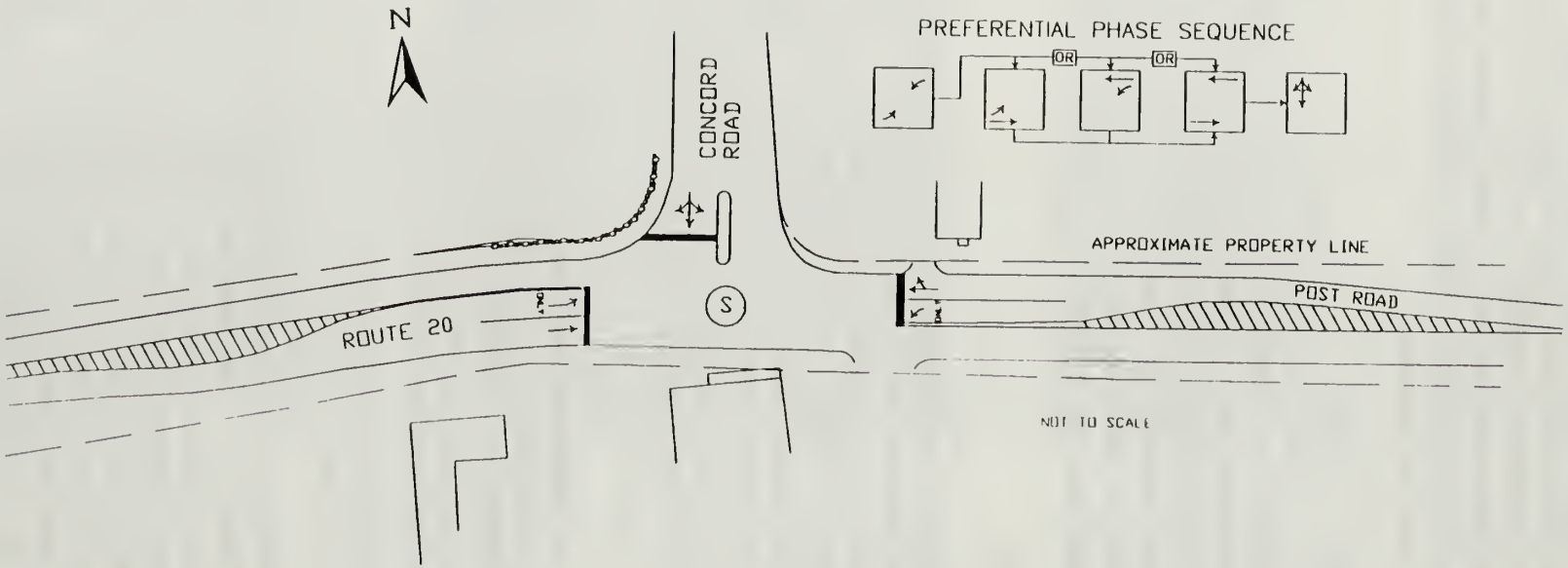


FIGURE 3-20
Sudbury
Route 20 at Concord Road
Proposed Signal Operation

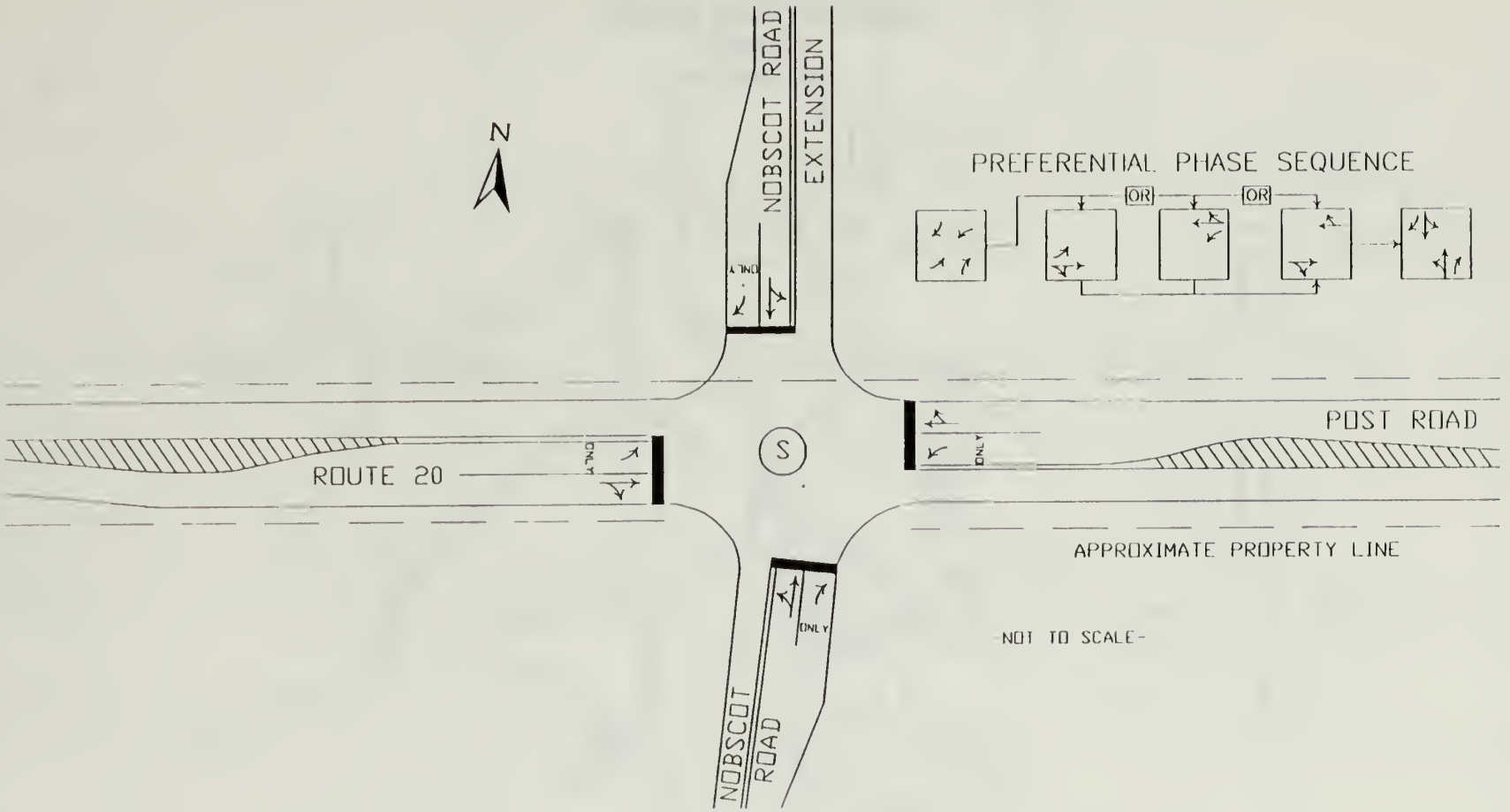


FIGURE 3-21
Sudbury
Route 20 at Nobscot Road Extension
Proposed Signal Operation

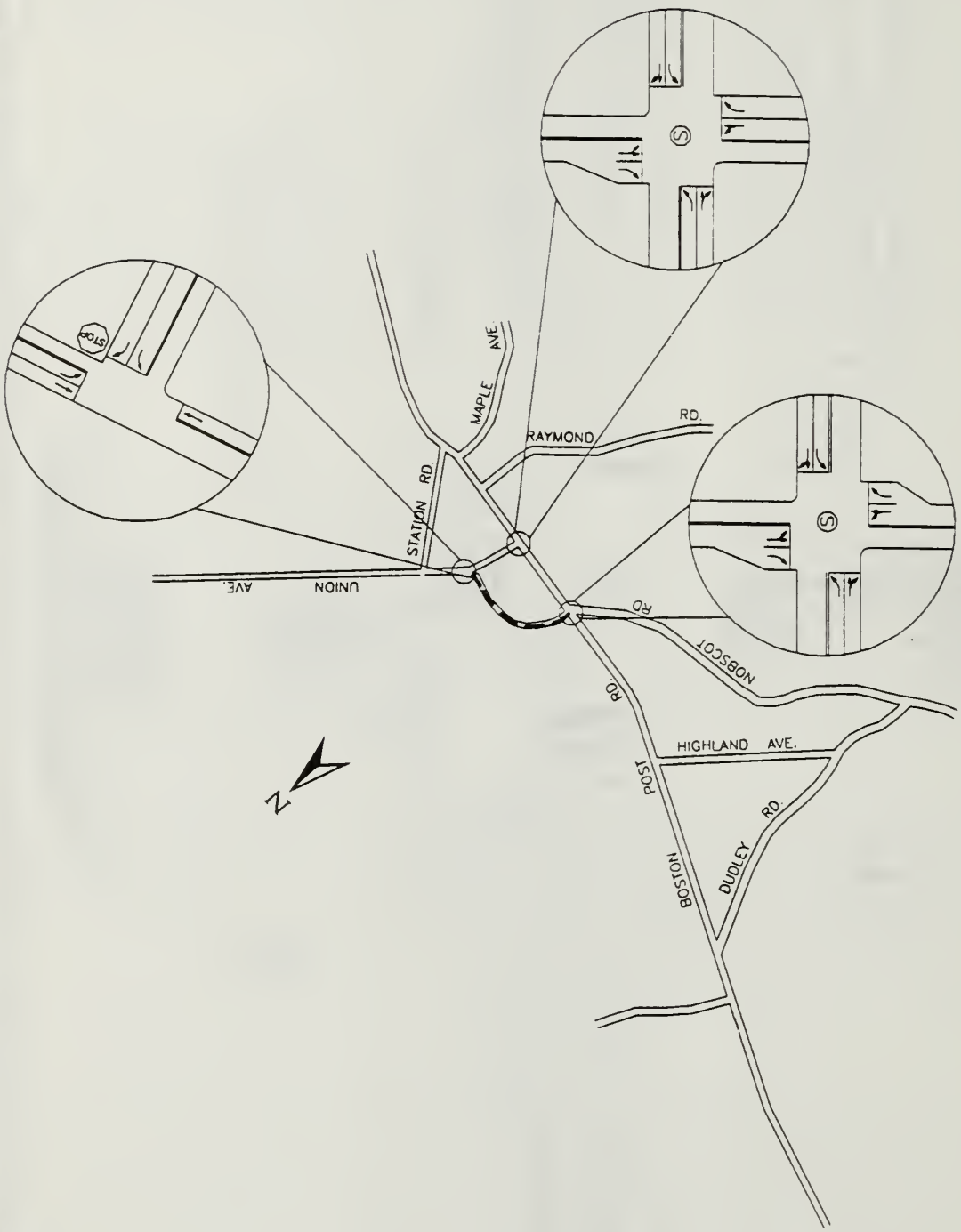


FIGURE 3-22
Sudbury
Nobscot Road Extension
Proposed Geometry

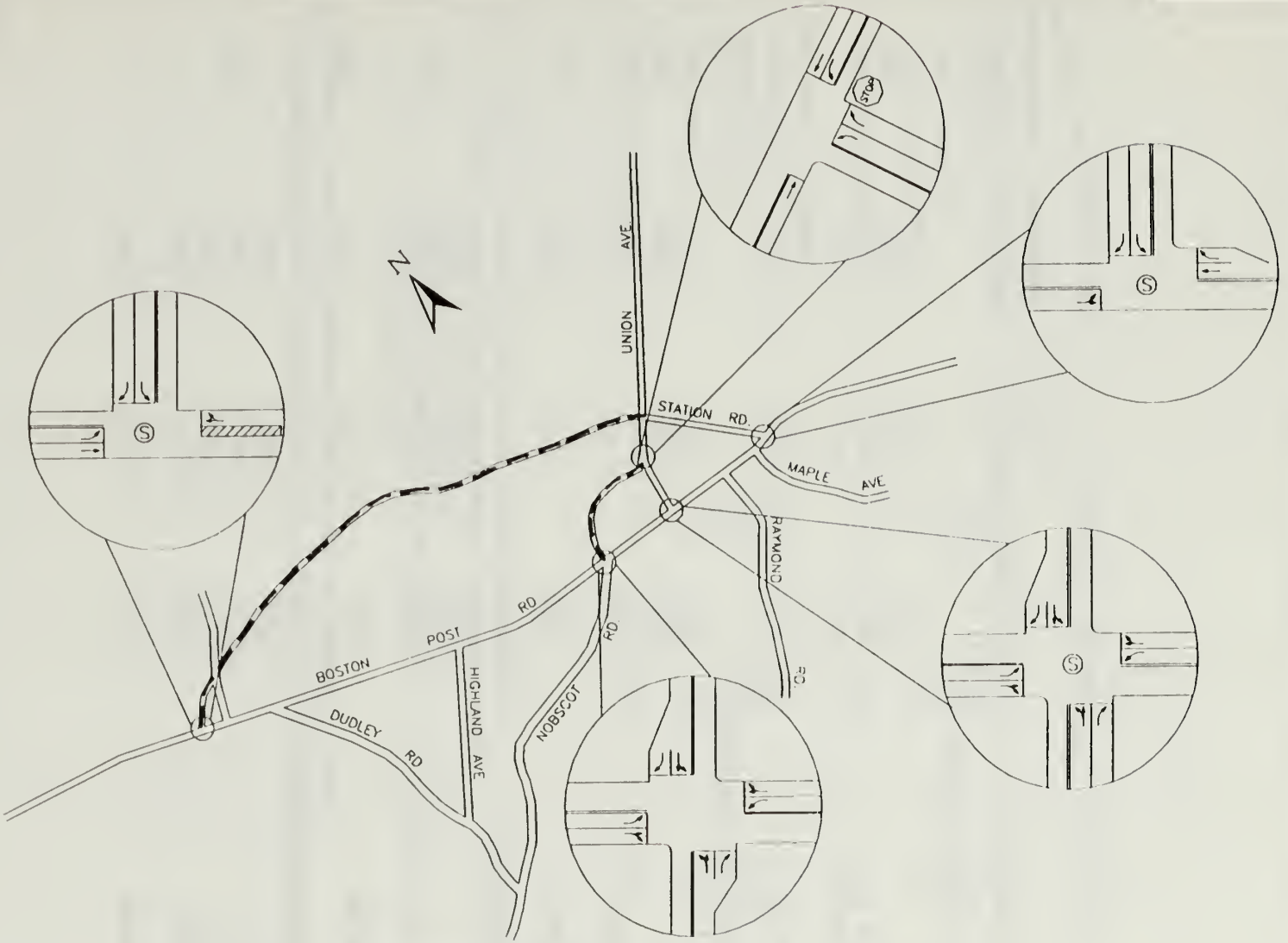


FIGURE 3-23
Sudbury
Full By-Pass
Proposed Geometry

Route 20 @	NO BUILD	BUILD Alternative 1[a]	BUILD Alternative2[b]	BUILD w/ Improvement Option
Wayside Inn Rd./Hager St. (signalized)				
Route 20 EB	B/9	B/10	B/10	
Route 20 WB	B/10	B/12	B/12	NC
Hager Street NB	B/11	B/14	B/14	
Wayside Inn Road SB	B/6	B/6	B/6	
Overall Intersection	B/10	B/12	B/12	
Wilson Street/Farm Road (signalized)				
Route 20 EB	B/12	B/15	B/15	
Route 20 WB	C/23	D/26	D/26	NC
Farm Road SB	C/21	D/33	D/33	
Wilson Street NB	E/45	C/20	C/20	
Overall Intersection	C/20	C/22	C/22	
Hosmer Street (signalized)				
Route 20 EB	B/15	C/19	C/19	
Route 20 WB	C/20	D/39	D/39	NC
Hosmer Street SB	D/36	F/66	F/66	
Overall Intersection	C/21	D/34	D/34	D/27
Lincoln St./Stevens St. (signalized)				
Route 20 NB	C/19	F/80	F/80	
Route 20 WB	C/15	E/42	E/42	NC
Lincoln Street EB	B/12	E/59	E/59	
Stevens Street SB	D/39	F/89	F/89	
Overall Intersection	C/17	E/59	E/59	

(cont.)

TABLE 3-12
Marlborough
2010 Levels-of-Service

Route 20 @	NO BUILD	BUILD Alternative 1[a]	BUILD Alternative2[b]	BUILD w/ Improvement Option
Pleasant St./South St. (signalized)				
Route 20 EB	F/120+	D/33	D/33	
Route 20 WB	F/120+	F/69	F/69	NC
South Street NB	F/120+	F/87	F/87	
Pleasant Street SB	D/32	C/21	C/21	
Overall Intersection	F/120+	E/50	E/50	
Glen Street (signalized)				
Route 20 EB	D/29	F/66	F/66	
Route 20 WB	C/22	D/32	D/32	NC
Glen Street NB	E/55	F/89	F/89	
Glen Street SB	C/18	C/21	C/21	
Overall Intersection	D/28	E/52	E/52	

KEY: X/XX Level of service/delay in seconds (PM peak hour).
F/120+ Degree of failure beyond limits of analysis equations. Delay in excess of 120 seconds.
NC No change in the level of service calculated for these movements (see discussion in text).

[a]Four lanes on Route 20 in Marlborough and the Nobscot Extension in Sudbury.
[b]Four lanes on Route 20 in Marlborough and both the Full By-Pass and Nobscot Extension in Sudbury.

TABLE 3-12 (cont.)
Marlborough
2010 Levels-of-Service

Public Works Section 61 Finding for each project. A copy of these two Findings are included in Appendix E.

- **Route 20 at Wayside Inn Road/Hager Street**

The City of Marlborough has decided to take the responsibility for implementing the necessary mitigation improvements at this intersection. The proposed geometry includes two through lanes eastbound on Route 20, one through/right lane and one through/left lane westbound on Route 20, and one general purpose lane both northbound and southbound. Pavement markings, signing and traffic signal operations will also be modified.

Acceptable levels of service would be expected in the 2010 base scenario with this proposed geometry. In both of the Build scenarios, a small amount of additional Route 20 traffic would be expected from the addition of a full four lane cross section. This increase, however, could be easily accommodated by this signal design and Base levels of service would be maintained. No additional improvements are recommended.

- **Route 20 at Wilson Street/Farm Road**

The improvements required at this intersection have been assigned as a portion of the mitigation for the Indian Hill Park project. The proposed geometry includes: one exclusive left lane one through lane and one through/right lane eastbound on Route 20, one exclusive left turn lane one through lane and one through/right lane westbound on Route 20, one exclusive left turn lane one through lane and two exclusive right turn lanes northbound, and one through/left lane and one exclusive right turn lane southbound. Pavement markings, signing and traffic signal operations will also be modified.

Acceptable levels of service would be expected in the 2010 base scenario with this proposed geometry. As noted above, a small amount of additional Route 20 traffic would be expected in both of the Build scenarios. Minor modifications to the timing plan would be required to accommodate this additional traffic. Levels of service would decline slightly on most approaches because of this reallocation of time, however the overall intersection would continue to operate acceptably. No additional improvements are recommended.

- **Route 20 at Hosmer Street**

The improvements required at this intersection have been assigned as a portion of the mitigation for the Post Road Shopping Plaza development. The proposed geometry includes: one exclusive left turn lane and two through lanes eastbound on Route 20, one exclusive right turn lane and two through lanes westbound on Route 20, and one exclusive left turn lane and one exclusive right

turn lane southbound. Pavement markings, signing and traffic signal operations will also be modified.

Acceptable levels of service would be expected in the 2010 Base scenario with this proposed geometry. Modifications to the timing plan would be required under the two Build scenarios. With this change, traffic on the Hosmer Street southbound approach will begin to experience unacceptable delays. During the negotiations of the Section 61 Finding, it was recommended that the geometry of this approach be widened to accommodate a second left turn bay. It was determined, however, that right of way constraints would prohibit this design and the recommendation was rejected. Although this approach may begin to fail, the overall intersection will continue to operate acceptably. No additional improvements are recommended.

- **Route 20 at Lincoln Street/Stevens Street**

The mitigation required at this location has been assigned to the Indian Hill Park project. The proposed geometry includes one left/through lane and one right/through lane eastbound on Lincoln Street, one through/right lane and one exclusive right turn lane westbound on Route 20, one through lane and one exclusive right turn lane northbound on Route 20, and one through/right turn lane southbound on Stevens Street. Left turn prohibitions northbound and southbound will be implemented at this intersection. Necessary pavement markings, signing and traffic signal modifications will also be made.

Acceptable levels of service would be expected in the 2010 Base scenario with the proposed geometry and turn restrictions described above. Some deterioration during the peak hours would be expected under the two 2010 Build scenarios. No additional improvements are recommended.

- **Route 20 at Pleasant Street/South Street**

Unacceptable levels of service are expected in the 2010 Base scenario. The additional conflicting turning movements compound the existing capacity deficiencies. In the two Build scenarios, a two lane Route 20 approach is assumed for both legs of the intersection. With this widening and assumed signal timing modifications, improvements would be expected at this location. No additional improvements are recommended.

- **Route 20 at Glen Street**

Improvements made to this intersection by the MDPW in conjunction with the Felton Street by-pass project are assumed in each of the 2010 scenarios. Acceptable levels of service are expected under the Base condition. Some degradation would be expected during the peak hour under the two Build scenarios with the increase in Route 20 traffic. However, no additional improvements are recommended.

3.6.2 Additional Analysis in Marlborough

During the preparation of this corridor study, several proposals for developments along Route 20 were submitted to the City of Marlborough and to the MDPW for approval. Concurrently, the City had a conceptual plan for this area prepared by a private consultant which recommended that sections of Route 20 be widened to a four lane cross section. CTPS was asked to review the mitigation and traffic plans for the various projects because of their location and immediate impact on the study area.

Preliminary results of the corridor study analyses were presented at several meetings to the City and the MDPW. The recommendation was made by CTPS that intersection level improvements should be the initial focus of any corridor wide improvement rather than select roadway widening. It was agreed upon by the City, after much discussion, and the Department that this was a valid approach to take and that the mitigation that is proposed for local development should be designed to work toward this goal. After an exhaustive review process, several intersection improvements that are described above were committed to by the developers of the Post Road Shopping Center, Indian Hill Park and the City as mitigation for these developments.

In addition to this work, various meetings were held and presentations made on additional analysis requested by the City for a number of other proposals and access options in this area. Throughout this process, the City urged that two issues be considered:

1. improved access for existing development
2. adequate access to Route 20 from new development.

Our primary goals were to demonstrate the effects of these various options on Route 20 through traffic and to minimize their impacts on the intersections where improvements have been committed. A summary of this work is presented in Table 3-13 and in Appendix E.

Scenario		West Site Drive	East Site Drive	Raytheon Drive	Total Delay* (Seconds)
1. Proposed geometry	Intersection	B/12	-	C/22	
	Route 20 EB	B/12	-	C/19	31
	Route 20 WB	B/8	-	C/20	28
2. North side access from existing parcels at West Site Drive	Intersection	E/40	-	C/22	
	Route 20 EB	C/19	-	C/19	38
	Route 20 WB	E/48	-	C/20	68
3. North side access from existing parcels and proposed development at West Site Drive	Intersection	E/54	-	C/23	
	Route 20 EB	C/23	-	C/19	42
	Route 20 WB	F/70	-	C/21	91
4. North side access from proposed development at Raytheon Drive	Intersection	B/13	-	D/35	
	Route 20 EB	B/14	-	D/27	41
	Route 20 WB	B/9	-	D/37	46
5. North side access from existing parcels and proposed development at West Site Drive and Raytheon Drive	Intersection	E/49	-	C/24	
	Route 20 EB	C/21	-	C/24	45
	Route 20 WB	F/64	-	C/23	87
6. North side access from existing parcels at West Site Drive (with jughandle)	Intersection	D/35	-	C/22	
	Route 20 EB	C/18	-	C/19	37
	Route 20 WB	D/32	-	C/29	52
7. North side access from existing parcels and proposed development at West Site Drive (with jughandle)	Intersection	F/60	-	C/23	
	Route 20 EB	D/25	-	C/19	44
	Route 20 WB	F/64	-	C/21	85
8. North side access from existing parcels and proposed development at West Site Drive and Raytheon Drive (with jughandle)	Intersection	E/54	-	C/24	
	Route 20 EB	C/23	-	C/24	47
	Route 20 WB	E/56	-	C/23	79
9. North side access from existing parcels at West Site Drive (with couplet)	Intersection	C/18	A/4	C/22	
	Route 20 EB	B/5	B/5	C/19	29
	Route 20 WB	C/17	A/2	C/29	39

(cont.)

TABLE 3-13
Marlborough, Route 20 East
2010 Access Scenarios
PM Peak Hour Levels-of-Service

Scenario		West Site Drive	East Site Drive	Raytheon Drive	Total Delay (Second
10. North side access from existing parcels and proposed development at West Site Drive (with couplet)	Intersection	D/25	A/4	C/23	
	Route 20 EB	B/7	B/5	C/29	31
	Route 20 WB	D/27	A/2	C/21	50
11. North side access from existing parcels and proposed development at West Site Drive and Raytheon Drive (with couplet)	Intersection	D/28	A/4	C/24	
	Route 20 EB	B/10	B/5	C/24	39
	Route 20 WB	D/27	A/2	C/23	52

KEY: X/XX Level of service/delay in seconds (PM peak hour).

*Sum of approach delays.

TABLE 3-13 (cont.)
Marlborough, Route 20 East
2010 Access Scenarios
PM Peak Hour Levels-of-Service

4 Conclusions

Previous sections have compared the traffic patterns of the 2010 No-Build alternative to the 1987 existing conditions, and have analyzed selected alternatives 1 and 2 and two traffic circulation options in Weston by comparing their traffic patterns to those of the No-Build. The impacts of the changes have been quantified by intersection level of service analysis. This section presents a summary of the traffic patterns and changes that occur under the No-Build and selected improvement alternatives.

No-Build Alternative

The purpose of studying this option was to create a basis for comparison of the Build alternatives. Also, because it contains no major changes in the roadway network, its comparison with the 1987 base gives the "pure" effect of the changes in land use that are projected for the year 2010.

Between 1987 and 2010, PM peak period traffic grows by 20 to 50 percent. The higher growth occurs in the towns of Weston and Marlborough in the vicinity of Routes 128 and 495. The lower growth is observed in the towns of Wayland and Sudbury.

Analysis of the 2010 through/local mix of traffic along the corridor showed that 50 percent of the two-way Route 20 traffic at the Waltham/Weston town line travels through Weston; 26 percent of the two-way traffic at the Weston/Wayland town line travels through Wayland; 26 percent of the two-way traffic at the Sudbury/Wayland town line travels through Sudbury; and 5 percent of the two-way traffic at the Sudbury/Marlborough town line travels through Marlborough.

At the Sudbury/Wayland town line, a possible location for the establishment of a commuter park-and-ride facility, 60 percent of the total traffic represents exchanges between locations within the study area towns and the rest between study area locations and points along Route 128. The number of vehicle trips passing through this location with Boston destinations is very low. This could indicate that the majority of Marlborough and Sudbury traffic to Boston filters to the Massachusetts Turnpike through north-south facilities west of this location.

As in base 1987 conditions, the presence of north-south trips on Route 20 continues. There are probably numerous locations where this phenomenon occurs; however, the locations which stand out are at School Street, Wellesley Street and

Old Boston Post Road in Weston, Old Connecticut Path in Wayland, and Nobscot and Union streets in Sudbury.

The intersection level-of-service analysis showed an increase in delay and queue lengths between 1987 and 2010. However, a number of locations, in particular in Marlborough where improvements have been built or anticipated from development mitigation, showed marked improvements from 1987 conditions.

Preferred Build Alternatives

The purpose of these alternatives was to examine the effect of segmented Route 20 improvements at each of the four towns. The common features of the two options are: a four-lane Route 20 in Marlborough, a three-lane Route 20 in Weston east of Wellesley Street and a two-lane Route 20 in the rest of its length. The two alternatives differ in Sudbury, where the first includes the correction of the Nobscot/Union Street off-set while the second, in addition to that correction, includes the full bypass between Station Road and Horse Pond Road.

For both alternatives, analysis showed that the widening of Route 20 to four lanes in Marlborough causes Route 20 traffic increases from the No-Build case in Marlborough and just east of the Marlborough/Sudbury town line. These increases are from traffic which, under the 2010 No-Build case, would be on east/west roads in Marlborough and western Sudbury. Therefore, the shift of traffic to Route 20 would be beneficial to local roads. Intersection analysis in Marlborough showed that, with minor signal modifications at the time of the widening, the development mitigation and other committed improvements will allow the intersections to accommodate the additional traffic within acceptable levels-of-service.

The three-lane Route 20 in Weston also causes some traffic increase which, however, is limited to the widened segment only. About half of the additional traffic is caused by shifts in traffic movements within the town of Weston. The rest is traffic from points south of town.

Since the widenings in Marlborough and Weston do not affect the rest of Route 20, the level of service of the intersections in Weston and Wayland remains unchanged from the No-Build, in both alternatives. In Weston, the results of the level-of-service analysis showed that for both the No-Build and Build cases, the Route 20 approaches at School and Wellesley streets will require two through lanes. Another conclusion of the analysis was that a traffic signal is needed at Wellesley Street and exclusive northbound and southbound left turn lanes are needed at the School Street intersection. These improvements result in higher benefits than the two additional traffic circulation variations which are discussed later in this section and they would probably require the greatest amount of right-of-way takings.

In Wayland, at the intersection of Route 20 at Routes 27/126, the addition of a second general-purpose eastbound lane and the inclusion of a protected north/

south phase in the signal design are the minimum modifications found necessary at this location. The construction of an exclusive right turn lane at the westbound approach would enhance even more the processing capacity of this intersection and would, in turn, allow for the introduction of a pedestrian phase for the safe crossing of pedestrians and bicycles. However, even with this design, only a marginally acceptable overall level of service is expected.

At Pelham Island Road, the signal at Routes 27/126 will keep providing acceptable gaps for Pelham Island traffic to cross Route 20. However, the northeastern end of Pelham Island Road is expected during the peak hours to be blocked by southbound vehicles on Routes 27/126.

In Sudbury, the Nobscot Road extension is very beneficial to the Route 20/ Union Street intersection because of the reduction in the eastbound left turn volume in the evening (the right turn southbound volume in the morning). The conversion of the Nobscot Road intersection to a four-way one is a major benefit to this location and to the Route 20 segment between Nobscot Road and Union Street. The full bypass further improves this location by diverting a large portion of the Route 20 traffic, including the Raytheon traffic. The Nobscot extension is positively impacted by the Sudbury Route 20 bypass, to the point that this intersection is expected to function safely without a traffic signal.

Weston Variations of Build Alternatives

At the request of the Weston traffic committee, CTPS investigated two variations of the Preferred Build Alternatives. The purpose of these options was to improve traffic circulation in the area affected by traffic on School Street, Wellesley Street, the segment of Route 20 between them, and Old Boston Post Road between Route 20 and Church Street.

In the one-way circulation scheme, the level of service at all intersections is improved from the No-Build, but it is still only marginally acceptable at Wellesley and School streets. This option would probably require the least right-of-way acquisition, and it would require a change in the resident and general traffic travel patterns.

The left-turn restriction scheme also requires less right-of-way acquisition compared to the isolated improvements of the Build alternative. The level of service at the three Route 20 intersections analyzed is markedly improved over the No-Build and somewhat better than the Build alternative with isolated improvements. This option will change the travel patterns in Weston between Route 30 and Route 20. It will also increase traffic at Route 128 south of Route 20, Highland Street and Old Boston Post Road in Weston, and Old Connecticut Path in Wayland.

Transit Options

Analysis showed no evidence of a substantial increase in demand for commuter rail or express bus service in the towns along the corridor. Any small increases are anticipated to be served well by existing transit services. The principal factors influencing these determinations are that: (1) presently Route 20 is not used primarily for trips to downtown Boston, but primarily serves traffic to/from Route 128 and intertown traffic; (2) the number of residents of corridor communities employed in downtown Boston is not expected to increase significantly; (3) highway travel times from corridor communities to Boston are not expected to increase in the future by as much as other corridor travel times in the region; (4) the Route 20 corridor is well served by two commuter rail lines, the Fitchburg and Framingham lines; (5) Riverside, served by MBTA express buses and the Green Line, and private company express buses in Framingham are within good access distance from Weston, most of Wayland and part of Sudbury; (6) a private local/express bus service already exists with a very low ridership record; (7) re-establishment of the discontinued commuter rail service from Sudbury, Wayland and Weston would be extremely costly.

However, the identification of a Route 20 location as a commuter park-and-ride facility could possibly benefit the existing bus riders to Boston or lead to the establishment of a new feeder bus service to Riverside.

The commuter traffic to Route 128 destinations is a very difficult market to serve because it is a "many-to-many" type of trip exchange. In addition, employee parking at businesses along Route 128 is free. The most efficient demand reduction measure for this type of market is the promotion of carpools and vanpools with employer initiatives.

5 Recommendations

Based on the preceding analysis and conclusions, the following recommendations can be made.

- The variety of land uses associated with the Route 20 corridor in each of the four communities and the different community goals and objectives for improving Route 20 dictate that future travel demand be accommodated with a number of segmented improvements at critical locations along the corridor. The improvements recommended below were designed to meet projected 2010 land-use demands and do not necessarily meet demand from additional growth.

- The construction of sidewalks, where appropriate, in conjunction with state highway projects is fully supported and recommended in all towns. After construction, sidewalk maintenance becomes a town responsibility through a memorandum of understanding (MOU) signed by the MDPW and the town.

- In **Marlborough**, the widening of Route 20 from Stevens Road to just west of the Marlborough/Sudbury town line is recommended. Because most of the intersections analyzed in Marlborough will be at a delicate demand/capacity balance, any traffic beyond that associated with projected 2010 land use will cause unacceptable levels-of-service.

- In **Sudbury**, the construction of the Nobscot Road extension is strongly recommended. The Sudbury Village bypass may deserve more study by the town in the future.

- In **Wayland**, the reconstruction of the Routes 20/126/27 intersection with the exclusive right turn lane and the pedestrian signal phase is strongly recommended. The design of this signal with traffic preemption features for the police and the fire department is also strongly recommended.

  For Pelham Island Road the following is recommended: traffic channelization should be implemented at the Route 20/Pelham Island Road intersection; the "DO NOT BLOCK INTERSECTION" sign facing the Routes 27/126 southbound traffic before the intersection of Routes 27/126 with Pelham Island and Millbrook roads should be kept visible at all times.

The analysis at Old Connecticut Path showed that traffic signal control will be necessary by 2010. It is recommended that this location be monitored periodically and the signal installed only if it meets the necessary warrants.

The establishment of a commuter park-and-ride lot is recommended. Its existence should be publicized to residents and bus operators. It is also recommended that the route and service schedule of the Big W bus be made known to the residents of the study-area towns and adjacent towns through a mailing.

- In **Weston**, it is recommended that Route 20 be marked as a three-lane facility east of Wellesley Street for the purpose of processing eastbound traffic faster in the morning.

  The restriction of left turns from the east and the west of Route 20 at School and Wellesley streets and the associated geometric design changes are not recommended, because they divert traffic to other local roads in Weston and roads of adjacent towns. Of particular importance are the expected diversions to Old Boston Post Road, for the benefit of which the present Route 20 Bypass was originally built. Instead, the isolated improvements at Highland, School and Wellesley streets with coordinated traffic control are recommended. The recommended geometric design includes three-lane Route 20 approaches at Wellesley, School and Highland streets, with exclusive left turn lanes.

Appendix A

Addendum to
Route 20 Corridor Planning Study:
Short-Range Element

CTPS

State Transportation Building
Ten Park Plaza, Suite 2150
Boston, MA 02116-3968
(617) 973-7100
Fax: (617) 973-8855

CENTRAL
TRANSPORTATION
PLANNING
STAFF

MEMORANDUM

TO: MDPW, MetroWest, Weston, Wayland, Sudbury and Marlborough

May 23, 1989

FROM: Efi Pagitsas

RE: Addendum to Route 20 Corridor Planning Study: Short-Range Element

INTRODUCTION

The Route 20 Corridor Planning Study Short-range report was approved by the Subsignatory Committee at its November 3, 1988, meeting and then transmitted to the MetroWest Transportation Task Force and released to the general public. On January 10, 1989, a formal presentation of its findings and recommendations was made to the task force. At that meeting, town representatives were requested to review the report and submit comments to be forwarded to the MDPW.

From subsequent meetings with the MDPW and town officials, telephone conversations, written comments and knowledge of impending development mitigation in the Route 20 towns, I have compiled a number of updates to the recommendations of the report. Some of the updates reflect the towns' preferred treatment of the problem locations; some reflect projects committed/anticipated by the state, town or developers and others reflect changes which occurred since the data collection and the analysis took place. They are listed below by town and intersection location.

The purpose of this addendum is to inform the MDPW and the towns of Weston, Wayland, Sudbury and Marlborough about the modified recommendations for improvements and identify a course of action for implementation. The MDPW and the four towns showed a strong interest in the production of this document. Once endorsed, it could be used as a vehicle for implementation.

WESTON

My comments regarding Weston intersections are based on telephone conversations with Ms. Jean Thurston, Weston Selectman; a meeting with Ms. Susananne Haber, member of the Planning Board; a copy of a letter to MetroWest by Ms. Elizabeth Munro, also a member of the Weston Planning Board; and a Weston Planning Board

letter to CTPS on short-and long-term alternatives which could be implemented in the town.

Route 20 at Wellesley Street and Old Boston Post Road

Rear-end and angle/sideswipe accidents prevail at this location. The level of service is poor during both peak hours (especially so in the morning) due to high conflicting volumes and inadequate channelization.

The original recommendation for this unsignalized intersection was to install a traffic signal, as signal warrant analysis indicated; stripe the Route 20 approaches as two lanes; and coordinate with the Route 20 and School Street intersection. Note that the same recommendation was made to the MDPW by TAMS intheir 1972 TOPIC report.

One resident expressed several concerns about the installation of a traffic signal at this location, primarily: increases in noise, pollution,and rear-end accidents and proximity to the School Street intersectionand the prespective new signal at the Mass. Broken Stone drive. However, she recognized that the intersection is problematical during the peak hours.

In light of the results of the warrant analysis and the type of accidents found at this location, a traffic light is long overdue. Therefore, the recommendations are as follows:

- A traffic signal should be installed at this location.
- The signal should be coordinated with that at School Street. The feasibility of flashing mode operation outside the peak hours should also be investigated.
- "SIGNAL AHEAD" warning sign should be installed at the crest of the hill on Wellesley Street before it meets Route 20.
- The Route 20 westbound approach should be striped as two general-purpose lanes with two receiving lanes tapering off to one within a distance of approximately 350 feet. The length of the second westbound lane will be dictated by sight distance and queue length considerations at the design stage of implementation. It appears that this change is feasible since the pavement width is 45-50 feet in the vicinity of the intersection and about 36 feet to the east of the intersection.
- Route 20 eastbound should be striped as one general-purpose lane.
- Route 20 eastbound, between the intersection and the ramps at Route 128, should be striped as two lanes. The second lane

should startat the pointwhere the second westbound approach lane ends. This improvement can be done within the existing pavement width forthe benefit of the morning eastbound traffic.

Route 20 at School Street

This intersection is characterized by poor level of service during the peak hours due to heavy north-south conflicting volumes, high Route 20 through traffic and insufficient capacity. The signal equipment needs to be replaced. The majority of the accidents are of the rear-end type.

The original recommendation for this intersection was to stripe the Route 20 approaches as two lanes (the pavement width in the vicinity of the intersection is about 50 feet), and to replace/retime the traffic signal and coordinate with that at Wellesley Street.

While a significant improvement is expected from this treatment, the intersection will still fail due to the heavy north-south, conflicting School Street movements. To correct this problem theSchool Street approaches need to include exclusive left-turn lanes which would require a total pavement width of 36 feet for a standard-lane-width design. However, the existing pavement width is 31 feet at the intersection, less away from it.

The search for additional north-south capacity led to the idea of the one-way counterclockwise circulation scheme (as shown on page 53 of the Short Range report) which is expected to upgrade the level of service at the School and Wellesley Street intersections to better than acceptable. Despite the marked improvement, this recommendation has been received extremely unfavorably by the town of Weston out of fear of traffic diversions from Route 20 to local streets.

In light of the needs at this intersection and the town's concerns, the recommendations are as follows:

- Stripe the Route 20 eastbound approach as two general purposelanes with two receiving lanes tapering off to one (within about 320 feet). The other Route 20 approach remains one lane.

- Investigate the possibility of redesigning the School Street approaches as an 11 foot exclusive left turn lane and a 10 footthrough/right turn lane. However, the MDPW might not allowsubstandard lane widths (less than 12 feet) for a new design. Inthat case the feasibility of redesigning within the right-of-way (approximately 48 feet) should be investigated.

- Replace signal equipment.

- Redesign the traffic signal to reflect new geometry.
- Coordinate the new signal with that at Wellesley Street.
- The one-way circulation scheme should be re-examined by CTPS in the long-range element of the Route 20 Corridor Planning Study.

WAYLAND

The updated recommendations for the town of Wayland are based on comments which I received from the Wayland Traffic Committee during their meeting on February 27 and several telephone conversations with Ms. Martha Taub, Chairman of the committee, and Mr. David Berry, Town Planner and member of the committee.

Route 20 at Old Connecticut Path

Accident analysis at this location did not indicate consistent-occurrences of an accident type. The major problem was detectedto be the lack of left-turn storage space from Route 20.

The recommendation in the short-range report was to prohibit left turns into Old Connecticut Path and direct these further west to the signalized intersection of Route 20 at Routes 126/27. Routes 126/27 intersect with Old Connecticut Path at a point one mile south of Route 20.

However, since approval of the report, left-turn storage was created through additional pavement on the northeast side of the intersection as part of town negotiations with the developer of a new shopping center at this location. Although I have not evaluated the new situation, I believe that it represents a significant improvement and a solution which the Wayland traffic committee strongly prefers to the rerouting option.

Route 20 at Routes 126/27

Angle and rear-end accidents are high at this location. In addition to the through movements from all four approaches, the north and south left turns and the east and west right turns are heavy. The signal equipment is old.

The original recommendation for this location was to reconstruct the Route 20 approaches as two lanes; replace signal equipment; and redesign the signal to reflect the new geometry and the additional traffic diverted here from Old Connecticut Path.

The recommended geometric improvements are feasible within the existing Route 20 right-of-way (from the layout lines indicated on the traffic signal permit, the right-of-way is 50-55 feet wide west of the intersection, 75-80 feet wide east of the intersection for about 280 feet, and 50 feet beyond that point), but not within the existing pavement width. The traffic committee indicated a strong interest in maintaining the existing pavement widths and sidewalks so that the intersection/roadway may continue serving vehicles, commuters and school children on bicycles, and pedestrians.

Following the modification in the recommendation for the Old Connecticut Path intersection and taking into account thecomments from the committee, the recommendations are as follows:

Immediate Future

- Stripe the westbound approach as an exclusive right and a through lane.

- Modernize the signal equipment.

- Redesign the signal phasing to include a southbound lead phase.

- Examine the feasibility (in terms of safety) of removing the "NO RIGHT TURN ON RED" signs.

  Although these improvements are extremely moderate compared to the actual needs at this location, a significant reduction in delay is expected. However, the intersection will continue to fail (unacceptable level of service), and long queues for

Longer Term Future

- Investigate the feasibility of reconstructing the Route 20 legsof the intersection as four lanes (two approach lanes and twoexiting lanes) within the existing right-of-way. Reconstruction appears to be feasible for the eastern leg but questionable for the western one, unless it is designed with substandard lanes to allow for sidewalks. However, bicycle traffic, which the committee identifies to be significant, might be at risk sharing the narrow lanes with vehicles.

- Examine the need for a bikeway facility to separate the bicycle traffic from the Route 20 vehicular traffic.

SUDBURY

Town representatives have found that projects which can be implemented quickly to have been very effective in the past, and therefore agree with the proposed improvements in the original

short-range report (as stated at the Metrowest Transportation Task Force meeting, February 7, 1989), In fact, the majority of the recommendations in the original report, those for the intersections at Concord Road, Union Avenue and Nobscot Road, are already being addressed by the Town as part of its downtown rehabilitation program.

The rehabilitation program is the result of Sudbury's 1986 Traffic Circulation Study and it includes a short term and a long-term element. In the short term, major improvements are curb-cut consolidations, a signal installation at Nobscot Road and coordination with that at Union Street, and channelization improvements between Nobscot Road and Union Avenue. The intersection improvements are funded by Raytheon.

In the long term, the study proposed a Route 20 bypass to the north of the existing road, construction of the Nobscot Road extension northerly along the Conrail right-of-way, and land use changes to create a "nodal" downtown. CTPS will examine Sudbury's long-term improvements in the long-range element of the Route 20 Corridor Planning Study.

In light of the Town's improvement plans, I recommend that the Town of Sudbury, EOTC, the MDPW and CTPS keep in contact to coordinate concurrent efforts.

MARLBOROUGH

Since the data collection and analysis were done for the short-range report, a number of environmental impact reports and other studies have been produced which include in their study area all of the intersections of Route 20 examined by CTPS except one (Route 20 at Pleasant Street and South Street).

The intersections of Route 20 at Wayside Inn and Hager Road, Farm Road and Wilson Street, and Stevens Street and Lincoln Street will be improved as part of the mitigation requirement by the developer of Indian Hill Shopping Center. The improvements will be designed to accommodate 1995 traffic conditions.

The intersection of Route 20 at Hosmer Street is under negotiation for mitigation by the developer of the Post Road Shopping Center.

There is no update for the original recommendations at Pleasant Street and South Street.

Finally, the intersection of Route 20 at Glen Street will be-reconstructed as part of the Felton Street relocation project by the MDPW

ACTION FOR IMPLEMENTATION

For the Towns of Weston and Wayland the recommendation is to endorse the suggested modification, and express interest in them in a letter to the MDPW Commissioner.

The interesection of Route 20 at School Street has been under in-house design(presently on hold, temporarily) by the MDPW for equipment replacement and new signals. Therefore, the Town of Weston should contact the MDPW without delay regarding the inclusion of additional improvements (e.g., left turn storage at School Street and the restriping of Route 20 eastbound).

For the Towns of Sudbury and Marlborough, the recommendation is to maintain contact with state agencies and keep them informed. Ideas for potential projects can still be brought up for inclusion in the long range report.

Appendix B

Automatic Traffic Recorder (ATR) Counts by Town

WESTON

Route 20, West of Route 128, July 22, 1990
Sudbury Road, West of Merriam St., July 22, 1990
Route 117, East of Conant Street, October, 1989
Conant Road, South of Route 117, October, 1989
Merriam Street, South of Route 117, October 1989
South Street over Stony Brook at Waltham City Line, December 18, 1988
Route 20, West of Route 128, October 23, 1988
Route 20, East of Route 128, October 23, 1988
Ramp, Route 128 S.B. to Route 20,October 23, 1988
Ramp, Route 20 W.B.to Route 128 N.B., October 23, 1988
Ramp, Route 20 E.B. to Route 20 W.B., October 23, 1988
Ramp, Route 20 W.B. to Route 128 S.B., October 23, 1988
Ramp, Route 20 E.B. to Route 128 N.B., October 23, 1988
Ramp, Route 128 S.B. to Route 20 E.B., October 23, 1988
Ramp, Route 128 N.B., to Route 20, October 23, 1988
Ramp, Route 128 S.B. to Route 20 W.B., October 23, 1988
Ramp, Route 20 E.B. to Route 128 S.B., October 23, 1988
Route 20, West of School Street, June 1986
School Street, South of Route 20, June 1986
Route 20 E.B., East of School Street, June 1986
Route 20 W.B., East of School Street, June 1986
School Street, North of Route 20, June 1986
Route 20, Boston Post Road, East of Wayland Town Line, November 1985

S002

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of July 22, 1990 *** Page 1

ta File : M0790038.PRN F.C. : 43
ation : 99603 INV. : 105
entification : 111416 Direction : Eastbound
ty/Town : ~~WALTHAM~~ WESTON Lane(s) : 1
cation : RTE.20, WEST OF RTE.128

ime	22 Sun	23 Mon	24 Tue	25 Wed	26 Thu	27 Fri	28 Sat	Wkday Avg.
:00			66	69	83			73
:00			45	39	31			38
:00			19	17	22			19
:00			22	18	12			17
:00			59	45	46			50
:00			228	188	222			213
:00			893	854	870			872
:00			1641	1581	1578			1600
:00			1750	1677	1761			1729
:00			1175	1128	1174			1159
:00			891	866	851			869
:00			822	840				831
:00			785	982				884
:00			754	1010				882
:00		751	795	849				798
:00		935	945	957				946
:00		957	1001	988				982
:00		1114	1029	1086				1076
:00		755	816	833				801
:00		562	615	601				593
:00		431	445	423				433
:00		396	377	367				380
:00		269	300	302				290
:00		147	168	180				165
als		6317	15641	15900	6650			15700

Peak Hr		09:00	09:00	09:00			
Count		1750	1677	1761			
Peak Hr		18:00	18:00	18:00			
Count		1114	1029	1086			

AWD : _____

FAC : (1.00)(.98)

ADT : 15,390

Combined: 30,150

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

*** Weekly Summary for week of July 22, 1990 *** Pag

Data File : M0790039.PRN F.C. : 43
Station : 99604 INV. : _____
Identification : 104016 Direction : Westbound
City/Town : ~~WALTHAM~~ WESTON Lane(s) : 1
Location : RTE.20, WEST OF RTE.128

Time	22 Sun	23 Mon	24 Tue	25 Wed	26 Thu	27 Fri	28 Sat	Wkday Avg.
01:00			109	127	134			123
02:00			44	73	59			59
03:00			25	33	48			35
04:00			23	21	23			22
05:00			32	34	26			31
06:00			123	96	134			118
07:00			599	546	584			576
08:00			1000	888	982			957
09:00			1085	867	1010			987
10:00			803	789	732			775
11:00			684	656	715			685
12:00			735	718				727
13:00			698	674				686
14:00			713	670				692
15:00		755	790	840				795
16:00		1056	1066	1365				1162
17:00		1330	1373	1305				1336
18:00		1645	1711	1508				1621
19:00		1198	1317	1203				1239
20:00		692	757	777				742
21:00		537	533	575				548
22:00		515	565	525				535
23:00		315	391	409				372
24:00		214	244	269				242
Totals		8257	15420	14968	4447			15065
AM Peak Hr			09:00	08:00	09:00			
AM Count			1085	888	1010			
PM Peak Hr		18:00	18:00	18:00				
PM Count		1645	1711	1508				

AWD : _____

FAC : (1.00)(.98)

ADT : 14,760

MHD 333 5003

1

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of July 22, 1990 *** Page 2

a File : M0790029.PRN F.C. : 116
tion : 9920201 INV. : _____
ntification : 104316 Direction : Northbound
y/Town : WESTON Lane(s) : 2
ation : SUDBURY RD., WEST OF MERRIAM ST.

me	22 Sun	23 Mon	24 Tue	25 Wed	26 Thu	27 Fri	28 Sat	Wkday Avg.
00			4	6	4			5
00			3	2	3			3
00			1	3	1			2
00			2	2	2			2
00			2	1	1			1
00			3	6	4			4
00			12	15	11			13
00			45	26	35			35
00			54	52	61			56
00			40	61	62			54
00			55	39	50			48
00			47	44	42			44
00			57	47				52
00			39	45				42
00		58	78	54				63
00		75	56	54				62
00		77	90	82				83
00		132	109	103				115
00		95	94	69				86
00		49	56	43				49
00		25	36	23				28
00		26	33	20				26
00		25	17	21				21
00		9	14	7				10
als		571	947	825	276			904
Peak Hr			11:00	10:00	10:00			
Count			55	61	62			
Peak Hr		18:00	18:00	18:00				
Count		132	109	103				

AWD : _____

FAC : (1.00)(.99)

ADT : 890

Combined: 1840

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

*** Weekly Summary for week of July 22, 1990 *** Page

Data File : M0790029.PRN F.C. : 16
Station : 9920201 INV. : _____
Identification : 104316 Direction : Southbound
City/Town : WESTON Lane(s) : 1
Location : SUDBURY RD., WEST OF MERRIAM ST.

Time	22 Sun	23 Mon	24 Tue	25 Wed	26 Thu	27 Fri	28 Sat	Wkday Avg.
01:00			2	0	5			2
02:00			0	2	0			1
03:00			0	2	2			1
04:00			2	1	2			2
05:00			1	0	0			0
06:00			7	7	8			7
07:00			26	38	32			32
08:00			130	106	116			117
09:00			137	138	142			139
10:00			62	64	73			66
11:00			61	36	56			51
12:00			52	56	60			56
13:00			56	57				57
14:00			65	47				56
15:00		46	54	46				49
16:00		62	51	66				60
17:00		56	55	52				54
18:00		63	59	36				53
19:00		49	62	43				51
20:00		27	47	27				34
21:00		65	22	20				36
22:00		23	14	9				15
23:00		8	24	7				13
24:00		9	6	5				7
Totals		408	995	865	496			959

AM Peak Hr		09:00	09:00	09:00
AM Count		137	138	142
PM Peak Hr	21:00	14:00	16:00	
PM Count	65	65	66	

AWD : _____

FAC : (1.00)(.99

ADT : 950

333 S004

Midd

AUTOMATIC TRAFFIC RECORDER COUNT - - SUMMARY

FOR: CENTRAL TRANSPORTATION PLANNING STAFF
BY: NORTHEAST TRAFFIC COUNTS
FILE: HAN-WES-13 L-57 L:52 #260

LOCATION: ROUTE 117
13 EAST OF CONANT STREET
North AVE 19

CITY/TOWN: WESTON, MASSACHUSETTS U2

DATE: OCTOBER, 1989

TOTAL HOURLY TRAFFIC VOLUMES

	SUN	MON	TUE 10/10	WED 10/11	THUR 10/12	FRI 10/13	SAT	
12- 1A	-	-	-	44	60	74	-	12-1 A
1- 2	-	-	-	15	23	22	-	1-2
2- 3	-	-	-	8	9	22	-	2-3
3- 4	-	-	-	6	7	5	-	3-4
4- 5	-	-	-	13	15	18	-	4-5
5- 6	-	-	-	78	106	163	-	5-6
6- 7	-	-	-	483	499	471	-	6-7
7- 8	-	-	-	1094	1177	1057	-	7-8
8- 9	-	-	-	1199	1236	1255	-	8-9
9-10	-	-	-	563	582	695	-	9-10
10-11	-	-	-	443	492	501	-	10-11
11-12	-	-	-	456	394	526	-	11-12
12- 1P	-	-	-	480	474	563	-	12-1 P
1- 2	-	-	-	425	459	484	-	1-2
2- 3	-	-	~~449~~	529	554	563	-	2-3
3- 4	-	-	688	746	728	-	-	3-4
4- 5	-	-	943	947	980	-	-	4-5
5- 6	-	-	1186	1186	1232	-	-	5-6
6- 7	-	-	837	818	808	-	-	6-7
7- 8	-	-	479	480	468	-	-	7-8
8- 9	-	-	263	295	318	-	-	8-9
9-10	-	-	216	277	304	-	-	9-10
10-11	-	-	185	212	218	-	-	10-11
11-12	-	-	97	124	137	-	-	11-12
TOTAL	0	0	~~5343~~ 4894	10921	11280	6419	0	TOTAL

11171
.95(.98)
ADT 10400

AWD
11171

333 S005

M.2d

AUTOMATIC TRAFFIC RECORDER COUNT - - SUMMARY

FOR: CENTRAL TRANSPORTATION PLANNING STAFF
BY: NORTHEAST TRAFFIC COUNTS
FILE: HAN-WES-14 L-57 L:52 #260

LOCATION: CONANT ROAD
14 SOUTH OF ROUTE 117

26

CITY/TOWN: WESTON, MASSACHUSETTS U6

DATE: OCTOBER, 1989

TOTAL HOURLY TRAFFIC VOLUMES

	SUN	MON 10/2	TUE 10/3	WED 10/4	THUR 10/5	FRI	SAT	
12- 1A	-	-	3	8	4	-	-	12-1 A
1- 2	-	-	1	1	0	-	-	1-2
2- 3	-	-	0	1	0	-	-	2-3
3- 4	-	-	0	0	2	-	-	3-4
4- 5	-	-	2	3	2	-	-	4-5
5- 6	-	-	2	2	3	-	-	5-6
6- 7	-	-	19	36	39	-	-	6-7
7- 8	-	-	100	130	124	-	-	7-8
8- 9	-	-	150	128	186	-	-	8-9
9-10	-	-	97	105	105	-	-	9-10
10-11	-	-	74	51	61	-	-	10-11
11-12	-	-	94	108	92	-	-	11-12
12- 1P	-	33	91	99	-	-	-	12-1 P
1- 2	-	63	70	70	-	-	-	1-2
2- 3	-	63	95	88	-	-	-	2-3
3- 4	-	79	98	82	-	-	-	3-4
4- 5	-	94	116	121	-	-	-	4-5
5- 6	-	110	140	134	-	-	-	5-6
6- 7	-	93	110	82	-	-	-	6-7
7- 8	-	59	54	99	-	-	-	7-8
8- 9	-	34	36	23	-	-	-	8-9
9-10	-	26	37	32	-	-	-	9-10
10-11	-	19	19	26	-	-	-	10-11
11-12	-	3	9	14	-	-	-	11-12
TOTAL	0	676	1417	1443	618	0	0	TOTAL

1385
.95(.99)
1385

DOT 1303

335 5006

M.DD

AUTOMATIC TRAFFIC RECORDER COUNT - - SUMMARY

FOR: CENTRAL TRANSPORTATION PLANNING STAFF
BY: NORTHEAST TRAFFIC COUNTS
FILE: HAN-WES-15 L-57 L:52 #260

LOCATION: MERRIAM STREET
15 SOUTH OF ROUTE 117

6

CITY/TOWN: WESTON, MASSACHUSETTS 36

DATE: OCTOBER, 1989

TOTAL HOURLY TRAFFIC VOLUMES

	SUN	MON	TUE	WED 10/4	THUR 10/5	FRI 10/6	SAT	
12- 1A	-	-	-	-	4	6	-	12-1 A
1- 2	-	-	-	-	0	0	-	1-2
2- 3	-	-	-	-	0	0	-	2-3
3- 4	-	-	-	-	0	1	-	3-4
4- 5	-	-	-	-	3	0	-	4-5
5- 6	-	-	-	-	5	3	-	5-6
6- 7	-	-	-	-	25	26	-	6-7
7- 8	-	-	-	-	109	106	-	7-8
8- 9	-	-	-	-	148	113	-	8-9
9-10	-	-	-	-	97	78	-	9-10
10-11	-	-	-	-	96	64	-	10-11
11-12	-	-	-	-	81	78	-	11-12
12- 1P	-	-	-	-	101	77	-	12-1 P
1- 2	-	-	-	-	69	74	-	1-2
2- 3	-	-	-	80	70	86	-	2-3
3- 4	-	-	-	93	86	106	-	3-4
4- 5	-	-	-	95	126	152	-	4-5
5- 6	-	-	-	130	116	149	-	5-6
6- 7	-	-	-	91	104	131	-	6-7
7- 8	-	-	-	48	57	47	-	7-8
8- 9	-	-	-	28	39	42	-	8-9
9-10	-	-	-	39	30	31	-	9-10
10-11	-	-	-	23	24	27	-	10-11
11-12	-	-	-	8	9	13	-	11-12
TOTAL	0	0	0	635	1399	1410	0	TOTAL

1404
.95(.99)
1320

AWT
1404

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of December 18, 1988 *** Page

Data File : M1288031.PRN
Station : 99101
Identification : 137122
City/Town : WESTON
Location : SOUTH ST. OVER STONY BROOK @ WALTHAM C.L

F.C. : ____
INV. : _____
Direction : Northbound
Lane(s) : 1

Time	18 Sun	19 Mon	20 Tue	21 Wed	22 Thu	23 Fri	24 Sat	Wkday Avg.
01:00			44	61				53
02:00			15	20				18
03:00			3	10				7
04:00			5	7				6
05:00			9	10				10
06:00			28	39				34
07:00			173	198				186
08:00			622	630				626
09:00			1162	1173				1168
10:00			587	580				584
11:00			320	351				336
12:00			320	361				341
13:00		358	362					360
14:00		390	402					396
15:00		391	380					386
16:00		384	384					384
17:00		363	399					381
18:00		359	369					364
19:00		258	304					281
20:00		195	216					206
21:00		167	215					191
22:00		165	200					183
23:00		114	143					129
24:00		65	102					84
Totals		3209	6764	3440				6714

AM Peak Hr		09:00	09:00
AM Count		1162	1173
PM Peak Hr	15:00	14:00	
PM Count	391	402	

$K_{AM} = \frac{1162+421}{6764+7305} = 11.0\%$ $T^{ad} = 1\%$ 1988 ADT = 13,980
$K_{PM} = \frac{369+1048}{6764+7305} = 10\%$ $T^{ch} = 1\%$ est. 2008 ADT = 19,500
D = 75%

AWD : _____
FAC : 1.00
ADT : 6710

Combined : 13,980

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of December 18, 1988 ***

File : M1288032.PRN
on : 99202
ification : 132122
Town : WESTON
ion : SOUTH ST. OVER STONY BROOK @ WALTHAM T.L
F.C. : ____
INV. : _____
Direction : Southbound
Lane(s) : 1

	18 Sun	19 Mon	20 Tue	21 Wed	22 Thu	23 Fri	24 Sat	Wkday Avg.
)			36	52				44
)			22	26				24
)			7	10				9
)			8	9				9
)			8	15				12
)			23	45				34
)			121	164				143
)			333	346				340
)			421	416				419
)			287	316				302
)			308	308				308
)			413	407				410
)		500	494					497
)		412	422					417
)		443	468					456
)		496	504					500
)		781	844					813
)		1091	1048					1070
)		531	581					556
)		315	344					330
)		209	246					228
)		159	179					169
)		97	99					98
)		70	89					80
-								
ls		5104	6997 7305	2114				7268

eak Hr 09:00 09:00
ount 421 416

eak Hr 18:00 18:00
ount 1091 1048

AWD : _____

FAC : 1.00

ADT : 7270

(8) 333 S

Str. 3 MIDD.

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 *** Page

Data File : M1088026.PRN
Station : 99303304
Identification : 136819
City/Town : WESTON
Location : RTE. 20, WEST OF RTE. 128

F.C. : U3
INV. : 2
Direction : Eastbound
Lane(s) : 1

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00				76				76
02:00				30				30
03:00				22				22
04:00				24				24
05:00				51				51
06:00				197				197
07:00				1018				1018
08:00				1615				1615
09:00				1775				1775
10:00				1089				1089
11:00				825				825
12:00				717				717
13:00				696				696
14:00			~~224~~	698				~~451~~ 698
15:00			832	805				819
16:00			1131	971				1051
17:00			1127					1127
18:00			1212					1212
19:00			871					871
20:00			576					576
21:00			349					349
22:00			363					363
23:00			274					274
24:00			185					185
Totals			7124	10609				~~15413~~ 1560
AM Peak Hr				09:00				
AM Count				1775				
PM Peak Hr			18:00	16:00				
PM Count			1212	971				

AWD : 15662
FAC : .90(.98)
ADT : 13800

Comb. 26800

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

File : M1088026.PRN
Jon : 99303304
ification : 136819
Town : WESTON
tion : RTE. 20. WEST OF RTE. 128

F.C. : 03
INV. : 2
Direction : westbound
Lane(s) : 2

	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
				128				128
				50				50
				18				18
				21				21
				45				45
				129				129
				594				594
				1176				1176
				1009				1009
				710				710
				616				616
				643				643
				655				655
698			~~733~~	701				717
			815	858				837
			999	973				986
			1258					1258
			1483					1483
			1143					1143
			784					784
			538					538
			535					535
			388					388
			247					247
15	s		8923	8326				14710

eak Hr		08:00
ount		1176
eak Hr	18:00	16:00
ount	1483	973

AWD : 14710
FAC : .90 (.98)
ADT : 13000

5002

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 *** Page

Data File : M1088027.PRN
Station : 99403404
Identification : 121619
City/Town : WESTON
Location : RTE. 20, EAST OF RTE. 128

F.C. : V3
INV. : 2
Direction : Eastbound
Lane(s) : 1

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00				124				124
02:00				63				63
03:00				51				51
04:00				37				37
05:00				71				71
06:00				257				257
07:00				1150				1150
08:00				1564				1564
09:00				1596				1596
10:00				1345				1345
11:00				1076				1076
12:00				1241				1241
13:00				1211				1211
14:00			1151	1165				1158
15:00			1211	1196				1204
16:00			1319	1391				1355
17:00			1437					1437
18:00			1587					1587
19:00			1183					1183
20:00			808					808
21:00			572					572
22:00			563					563
23:00			497					497
24:00			327					327
Totals			10655	13538				20477

AM Peak Hr		09:00
AM Count		1596
PM Peak Hr	18:00	16:00
PM Count	1587	1391

AWD : 20477
FAC : .90 (.98)
ADT : 18050

Comb. 34350

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

File : M1088027.PRN
tion : 99403404
ification : 121619
/Town : WESTON
tion : RTE. 20, EAST OF RTE. 128

F.C. : 03
INV. : 2
Direction : Westbound
Lane(s) : 2

e	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	wkday Avg.
0				148				148
0				74				74
0				35				35
0				35				35
0				52				52
0				202				202
0				734				734
0				1455				1455
0				1333				1333
0				891				891
0				911				911
0				927				927
0				996				996
0			1074	1076				1075
0			1149	1222				1186
0			1377	1415				1396
0			1578					1578
0			1651					1651
0			1174					1174
0			758					758
0			620					620
0			544					544
0			440					440
0			261					261
ls			10625	11506				18476

eak Hr 08:00
ount 1455

eak Hr 18:00 16:00
ount 1651 1415

AWD : 18476
FAC : .90 (.98)
ADT : 16300

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for Week of October 23, 1988 ***

Data File : Y.288028.DRN
Station : 99E00
Identification : 139019
Dist/Town : WESTON
Location : RAMP, RTE. 128 S.B. TO RTE. 20
F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00				90				90
02:00				46				46
03:00				21				21
04:00				23				23
05:00				57				57
06:00				133				133
07:00				592				592
08:00				1205				1205
09:00				1130				1130
10:00				834				834
11:00				663				663
12:00				679				679
13:00				684				684
14:00				735				735
15:00			816	848				832
16:00			975	949				962
17:00			1208					1208
18:00			1344					1344
19:00			934					934
20:00			633					633
21:00			426					426
22:00			427					427
23:00			320					320
24:00			210					210
Totals			7293	8789				14288

AM Peak Hr		08:00
AM Count		1205
PM Peak Hr	18:00	16:00
PM Count	1344	949

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 *** Page -

File : M1088023.PRN F.C. : ____
on : 99600 INV. : _____
ification : 129319 Direction : Combined
wn : WESTON Lane(s) : 1
ion : RAMP, RTE. 20 W.B. TO RTE. 128 N.B.

	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
				60				60
				35				35
				14				14
				4				4
				23				23
				95				95
				301				301
				554				554
				580				580
				377				377
				413				413
				534				534
				543				543
				548				548
				605				605
			671	722				697
			734					734
			768					768
			481					481
			299					299
			231					231
			180					180
			175					175
			113					113
s			3652	5408				8364

ak Hr				09:00				
unt				580				
ak Hr			18:00	16:00				
unt			768	722				

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 *** Page

Data File : M1088023.PRN
Station : 99700
Identification : 104619
City/Town : WESTON
Location : RAMP, RTE. 20 E.B. TO RTE. 30 W.B.

F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00				48				48
02:00				18				18
03:00				8				8
04:00				11				11
05:00				8				8
06:00				34				34
07:00				221				221
08:00				415				415
09:00				339				339
10:00				260				260
11:00				233				233
12:00				220				220
13:00				243				243
14:00				256				256
15:00				261				261
16:00			310	291				301
17:00			361					361
18:00			473					473
19:00			412					412
20:00			259					259
21:00			162					162
22:00			167					167
23:00			141					141
24:00			86					86
Totals			2371	2866				4937

AM Peak Hr 08:00
AM Count 415

PM Peak Hr 18:00 16:00
PM Count 473 291

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 *** Page 1

File : M1088031.PRN F.C. : ____
on : 99800 INV. : _____
ification : 107719 Direction : Combined
Town : WESTON Lane(s) : 1
ion : RAMP. RTE. 20 W.B. TO RTE. 128 S.B.

	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkdav Avg.
				59				59
				28				28
				18				18
				30				30
				28				28
				89				89
				365				365
				895				895
				855				855
				556				556
				524				524
				551				551
				532				532
			503	550				527
			581	630				606
			693	709				701
			790					790
			843					843
			582					582
			362					362
			279					279
			264					264
			195					195
			110					110
s			5202	6419				9789
ak Hr				08:00				
unt				895				
ak Hr			18:00	16:00				
unt			843	709				

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 *** Page

Data File : M1088032.PRN
Station : 99900
Identification : 128719
City/Town : WESTON
Location : RAMP. RTE. 20 E.B. TO RTE. 128 N.B.
F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkdav Avg.
01:00				33				33
02:00				15				15
03:00				7				7
04:00				5				5
05:00				17				17
06:00				87				87
07:00				423				423
08:00				827				827
09:00				965				965
10:00				468				468
11:00				336				336
12:00				278				278
13:00				271				271
14:00				256				256
15:00			347	321				334
16:00			485	401				443
17:00			520					520
18:00			569					569
19:00			403					403
20:00			271					271
21:00			144					144
22:00			148					148
23:00			109					109
24:00			67					67
Totals			3063	4710				6996
AM Peak Hr				09:00				
AM Count				965				
PM Peak Hr			18:00	16:00				
PM Count			569	401				

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

File : M1088034.PRN
tn : 991000
ification : 112619
Town : WESTON
ion : RAMP. RTE. 128 S.B. TO RTE. 20 E.B.

F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
			51				51
			38				38
			29				29
			18				18
			44				44
			118				118
			586				586
			875				875
			903				903
			623				623
			477				477
			547				547
			559				559
			550				550
		554	575				565
		551	601				576
		687					687
		711					711
		479					479
		348					348
		250					250
		247					247
		209					209
		157					157
s		4193	6594				9647

ak Hr 09:00
unt 903

ak Hr 18:00 16:00
unt 711 601

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

Data File : M1088039.PRN
Station : 991100
Identification : 120119
City/Town : WESTON
Location : RAMP, RTE. 128 N.B. TO RTE. 20
F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00				103				103
02:00				48				48
03:00				38				38
04:00				20				20
05:00				27				27
06:00				149				149
07:00				719				719
08:00				1225				1225
09:00				1147				1147
10:00				903				903
11:00				740				740
12:00				677				677
13:00				728				728
14:00				794				794
15:00			843	804				824
16:00			905	959				932
17:00			1008					1008
18:00			1241					1241
19:00			1022					1022
20:00			666					666
21:00			437					437
22:00			434					434
23:00			396					396
24:00			243					243
Totals			7195	9081				14521

AM Peak Hr		08:00
AM Count		1225
PM Peak Hr	18:00	16:00
PM Count	1241	959

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 *** Page

File : Y1088040.PRN
On : 93-220 /2
Location : 139419
Town : WESTON
Loc : RAMP, RTE. 128 S.B. TO RTE. 20 W.B.

F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
			131				131
			54				54
			20				20
			23				23
			43				43
			126				126
			684				684
			1338				1338
			1107				1107
			762				762
			658				658
			655				655
			662				662
			741				741
		834	885				860
		1066	1007				1037
		1348					1348
		1629					1629
		1230					1230
		799					799
		558					558
		544					544
		387					387
		245					245
		8640	8896				15641

Peak Hr 08:00
Count 1338

Peak Hr 18:00 16:00
Count 1629 1007

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

*** Weekly Summary for week of October 23, 1988 ***

Data File : M1088041.PRN
Station : 991300
Identification : 137119
Div/Town : WESTON
Location : RAMP. RTE. 20 E.B. TO RTE. 128 S.B.

F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00				21				21
02:00				10				10
03:00				11				11
04:00				7				7
05:00				14				14
06:00				49				49
07:00				318				318
08:00				523				523
09:00				543				543
10:00				363				363
11:00				298				298
12:00				262				262
13:00				244				244
14:00				252				252
15:00			283	283				283
16:00			390	314				352
17:00			359					359
18:00			372					372
19:00			280					280
20:00			176					176
21:00			101					101
22:00			121					121
23:00			88					88
24:00			62					62
Totals			2232	3512				5109

AM Peak Hr		09:00
AM Count		543
PM Peak Hr	16:00	16:00
PM Count	390	314

AWD : _____

FAC : _____

ADT : _____

5001

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME SUMMARY

City/Twn :WESTON Year : 1986 Station :1 W.B.

Rte/St :RTE.20 W.B. Month : JUNE

Location :WEST OF SCHOOL ST.

DAY	SUN	MON	TUES	WED	THUR	FRI	SAT
DATE				4	5	6	
12-1 AM					136	142	
1-2					54	75	
2-3					33	18	
3-4					22	34	
4-5					20	19	
5-6					78	69	
6-7					444	402	
7-8					953	851	
8-9					925	748	
9-10					604	601	
10-11					552	542	
11-12				583	583		
12-1 PM				588	560		
1-2				627	591		
2-3				681	729		
3-4				943	916		
4-5				1033	1085		
5-6				1048	1034		
6-7				985	965		
7-8				642	622		
8-9				470	498		
9-10				482	431		
10-11				415	351		
11-12				266	233		
TOTAL	0	0	0	8763	12419	3501	0

Box No :

F.C. : U6

Inv. : 0002

Total : 24683

A.W.D. : 12,342

Factor : .8575

A.D.T. : 10585

No. of Days of Data : 2

5001
MAPC

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME SUMMARY

333

Cty/Twn :WESTON Year : 1986 Station :2 E.B.

Rte/St :RTE.20 E.B. Month : JUNE

Location :WEST OF SCHOOL ST.

DAY	SUN	MON	TUES	WED	THUR	FRI	SAT
DATE				4	5	6	
12-1 AM					65		
1-2					37		
2-3					31		
3-4					19		
4-5					48		
5-6					246		
6-7					986		
7-8					1202		
8-9					1175		
9-10					893		
10-11					717		
11-12				633	689		
12-1 PM				528	690		
1-2				634	721		
2-3				649	785		
3-4				913	925		
4-5				984	994		
5-6				1096	1026		
6-7				775	665		
7-8				516	413		
8-9				440	379		
9-10				366	263		
10-11				260	245		
11-12				194	168		
TOTAL	0	0	0	7988	13382	0	0

Box No :

F.C. : U6

Inv. : 0002

Total : 21370

A.W.D. : 13,382

Factor : .8575

A.D.T. : 11475

No. of Days of Data : 1

comb. 22060

5002

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME SUMMARY

City/Twn :WESTON Year : 1986 Station : S.B.

Rte/St :SCHOOL ST. Month : JUNE

Location :SOUTH OF RTE.20

DAY	SUN	MON	TUES	WED	THUR	FRI	SAT
DATE				4	5	6	
12-1 AM					14	14	
1-2					4	7	
2-3					4	2	
3-4						1	
4-5					5		
5-6					23	12	
6-7					131	124	
7-8					521	454	
8-9					557	576	
9-10					370	350	
10-11					322	316	
11-12				350	328		
12-1 PM				328	344		
1-2				331	344		
2-3				330	315		
3-4				381	355		
4-5				479	457		
5-6				573	525		
6-7				336	279		
7-8				264	147		
8-9				164	106		
9-10				103	77		
10-11				48	55		
11-12				40	43		
TOTAL	0	0	0	3727	5326	1856	0

Box No :

F.C. : U6

Inv. : 0066

Total : 10909

A.W.D. : 5,454.

Factor : .8575

A.D.T. : 4675

No. of Days of Data : 2

COMB. 9990

5002

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME SUMMARY

City/Twn :WESTON Year : 1986 Station :4 N.B.

Rte/St :SCHOOL ST. Month : JUNE

Location :SOUTH OF RTE.20

DAY	SUN	MON	TUES	WED	THUR	FRI	SAT
DATE				4	5	6	
12-1 AM					37	46	
1-2					9	24	
2-3					6	4	
3-4					3	4	
4-5					8	4	
5-6					12	4	
6-7					111	89	
7-8					349	362	
8-9					519	559	
9-10					314	344	
10-11					333	345	
11-12				373	346		
12-1 PM				376	365		
1-2				336	316		
2-3				427	485		
3-4				507	484		
4-5				503	511		
5-6				596	514		
6-7				524	411		
7-8				302	302		
8-9				266	194		
9-10				169	124		
10-11				180	124		
11-12				92	79		
TOTAL	0	0	0	4651	5956	1785	0

Box No :

F.C. : U6

Inv. : 0066

Total : 12392

A.W.D. : 6,196

Factor : .8575

A.D.T. : 5310

No. of Days of Data : 2

5003

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME SUMMARY

City/Twn :WESTON Year : 1986 Station :5 E.B.

Rte/St :RTE.20 E.B. Month : JUNE

Location :EAST OF SCHOOL ST.

DAY	SUN	MON	TUES	WED	THUR	FRI	SAT
DATE				4	5	6	
12-1 AM					74	108	
1-2					41	48	
2-3					28	17	
3-4					16	20	
4-5					42	29	
5-6					168	148	
6-7					826	745	
7-8					1138	1088	
8-9					1102	1043	
9-10					868	800	
10-11					692	605	
11-12				624	631		
12-1 PM				573	621		
1-2				582	606		
2-3				668	735		
3-4				859	859		
4-5				913	836		
5-6				1021	980		
6-7				758	695		
7-8				492	425		
8-9				422	375		
9-10				362	267		
10-11				255	243		
11-12				200	160		
TOTAL	0	0	0	7729	12428	4651	0

Box No :

F.C. : U6

Inv. : 0002

Total : 24808

A.W.D. : 12,404.

Factor : .8575

A.D.T. : 10635

No. of Days of Data : 2

Comb. 19590

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME SUMMARY

Cty/Twn :WESTON Year : 1986 Station :5 W.B

Rte/St :RTE.20 W.B. Month : JUNE

Location :EAST OF SCHOOL ST.

DAY	SUN	MON	TUES	WED	THUR	FRI	SA
DATE				4	5	6	
12-1 AM					130	119	
1-2					48	46	
2-3					35	27	
3-4					22	31	
4-5					21	28	
5-6					98	88	
6-7					475	422	
7-8					871	719	
8-9					754	579	
9-10					509	514	
10-11					479	483	
11-12				478	496		
12-1 PM				552	516		
1-2				535	514		
2-3				562	590		
3-4				807	769		
4-5				847	882		
5-6				860	817		
6-7				738	749		
7-8				546	522		
8-9				417	397		
9-10				417	356		
10-11				336	266		
11-12				205	198		
TOTAL	0	0	0	7300	10514	3056	0

Box No :

F.C. : U6

Inv. :0002

Total : 20870

A.W.D. : 10,43

Factor : .957

A.D.T. : 895

No. of Days of Data : 2

5004

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME SUMMARY

City/Twn :WESTON Year : 1986 Station :8 S.B.

Rte/St :SCHOOL ST. Month : JUNE

Location :NORTH OF RTE.20

DAY	SUN	MON	TUES	WED	THUR	FRI	SAT
DATE				4	5	6	
12-1 AM					10	12	
1-2						6	
2-3					1		
3-4							
4-5					1		
5-6					6	4	
6-7					123	94	
7-8					553	526	
8-9					545	595	
9-10					332	308	
10-11					266	293	
11-12				298	303		
12-1 PM				264	301		
1-2				278	282		
2-3				287	266		
3-4				377	339		
4-5				468	394		
5-6				516	510		
6-7				297	274		
7-8				188	116		
8-9				143	85		
9-10				94	76		
10-11				30	42		
11-12				31	32		
TOTAL	0	0	0	3271	4857	1838	0

Box No :

F.C. : U6

Inv. : 0066

Total : 9966

A.W.D. : 4,983

Factor : .8575

A.D.T. : 4270

No. of Days of Data : 2

5004

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME SUMMARY

City/Twn :WESTON Year : 1986 Station :7 N.B.

Rte/St :SCHOOL ST. Month : JUNE

Location :NORTH OF RTE.20

DAY	SUN	MON	TUES	WED	THUR	FRI	SAT
DATE				4	5	6	
12-1 AM					14	29	
1-2					5	8	
2-3					2		
3-4						2	
4-5					5	3	
5-6					4	4	
6-7					53	58	
7-8					188	186	
8-9					333	345	
9-10					192	241	
10-11					208	209	
11-12				211	205		
12-1 PM				229	254		
1-2				242	205		
2-3				254	286		
3-4				255	278		
4-5				272	274		
5-6				360	278		
6-7				261	189		
7-8				168	156		
8-9				170	90		
9-10				89	65		
10-11				67	49		
11-12				36	32		
TOTAL	0	0	0	2614	3365	1084	0

Box No :

F.C. : 06

Inv. : 0066

Total : 7063

A.W.D. : 3,532

Factor : .8575

A.D.T. : 3030

No. of Days of Data : 2

Comb.

5001

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME SUMMARY

City/Twn :WESTON Year : 1985 Station :

Rte/St :20 Boston Post Rd. Month : NOVEMBER

Location :E. OF WAYLAND T/L

DAY	SUN	MON	TUES	WED	THUR	FRI	SAT
DATE		18	19				
12-1 AM			167				
1-2			50				
2-3			49				
3-4			40				
4-5			54				
5-6			307				
6-7			1454				
7-8			2786				
8-9			2002				
9-10			1342				
10-11			1152				
11-12		1047					
12-1 PM		1038					
1-2		1133					
2-3		1310					
3-4		1680					
4-5		1908					
5-6		1969					
6-7		1508					
7-8		999					
8-9		701					
9-10		615					
10-11		473					
11-12		306					
TOTAL	0	14697	9403	0	0	0	0

Box No : 55

F.C. : 03

Inv. : 0002

Total : 24090

A.W.D. : 24090

Factor : .91

A.D.T. : 21900

No. of Days of Data : 1

WAYLAND

Route 20, West of Old Connecticut Path, July 22, 1990
Stone Bridge Road, West of Old Connecticut Path, July 22, 1990
Route 20 at Wayland/Weston Town Line, October 23, 1988
Route 20, East of Routes 126/27, October 23, 1988
Routes 126/27, South of Route 20, October 23, 1988

MID 315 5001

1

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of July 22, 1990 *** Page 1

File : M0790030.PRN F.C. : 113
on : 9930304 INV. : 19
tification : 109427 Direction : Eastbound
/Town : WAYLAND Lane(s) : 1
tion : RTE.20, WEST OF OLD CONNECTICUT PATH

e	22 Sun	23 Mon	24 Tue	25 Wed	26 Thu	27 Fri	28 Sat	Wkday Avg.
)			47	41	62			50
)			26	28	28			27
)			11	14	13			13
)			15	12	11			13
)			40	23	32			32
)			211	142	173			175
)			755	730	741			742
)			1207	1146	1251			1201
)			1093	927	1044			1021
)			837	719	786			781
)			649	594	652			632
)			631	603				617
)			643	585				614
)			599	577				588
)		596	656	544				599
)		730	706	700				712
)		700	719	677				699
)		756	787	713				752
)		554	531	605				563
)		400	439	441				427
)		331	360	297				329
)		295	290	274				286
)		219	215	221				218
)		112	132	126				123
s		4693	11599	10739	4793			11214

ak Hr		08:00	08:00	08:00
unt		1207	1146	1251
ak Hr	18:00	18:00	18:00	
unt	756	787	713	

AWD : _____

FAC : (1.00)(.98)

ADT : 10,990

Combined: 28,530

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of July 22, 1990 ***

Data File : M0790030.PRN
Station : 9930304
Identification : 109427
City/Town : WAYLAND
Location : RTE.20, WEST OF OLD CONNECTICUT PATH

F.C. : 43
INV. :
Direction : Westbound
Lane(s) : 2

Time	22 Sun	23 Mon	24 Tue	25 Wed	26 Thu	27 Fri	28 Sat	Wkday Avg.
01:00			103	136	142			127
02:00			52	72	60			61
03:00			25	36	39			33
04:00			22	25	23			23
05:00			33	41	28			34
06:00			153	127	162			147
07:00			706	678	771			718
08:00			1463	1412	1530			1468
09:00			1505	1231	1407			1381
10:00			1166	1030	1019			1072
11:00			929	908	910			916
12:00			963	900				932
13:00			1021	911				966
14:00			1003	895				949
15:00		882	1097	902				960
16:00		1173	1274	1182				1210
17:00		1288	1472	1324				1361
18:00		1484	1547	1490				1507
19:00		1167	1267	1327				1254
20:00		751	887	867				835
21:00		602	679	654				645
22:00		594	665	621				627
23:00		345	464	435				415
24:00		230	284	272				262
Totals		8516	18780	17476	6091			17903

AM Peak Hr		09:00	08:00	08:00
AM Count		1505	1412	1530
PM Peak Hr	18:00	18:00	18:00	
PM Count	1484	1547	1490	

AWD : _____
FAC : (1.00)
ADT : 17,54

M(5) 5002

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of July 22, 1990 ***

File	: M0790031.PRN	F.C.	: 16
ion	: 9940403	INV.	: 115
tification	: 133516	Direction	: Eastbound
/Town	: WAYLAND	Lane(s)	: 2
tion	: STONE BRIDGE RD., WEST OF OLD CONN. PATH		

e	22 Sun	23 Mon	24 Tue	25 Wed	26 Thu	27 Fri	28 Sat	Wkday Avg.
0			8	10	5			8
0			1	5	4			3
0			0	2	2			1
0			1	2	1			1
0			6	4	7			6
0			23	23	26			24
0			117	96	104			106
0			271	269	291			277
0			293	277	281			284
0			118	127	112			119
0			82	75	84			80
0			86	74				80
0			74	72				73
0			93	88				91
0		103	104	76				94
0		93	82	94				90
0		109	117	91				106
0		108	116	120				115
0		89	99	100				96
0		80	95	91				89
0		67	64	64				65
0		45	39	44				43
0		26	30	27				28
0		20	22	25				22
ls		740	1941	1856	917			1901
eak Hr			09:00	09:00	08:00			
ount			293	277	291			
eak Hr		17:00	17:00	18:00				
ount		109	117	120				

AWD : _____

FAC : (1.00)(.99)

ADT : 1880

Combined: 3890

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of July 22, 1990 ***

Data File : M0790031.PRN
Station : 9940403
Identification : 133516
City/Town : WAYLAND
Location : STONE BRIDGE RD., WEST OF OLD CONN. PATH

F.C. : 46
INV. :
Direction : Westbound
Lane(s) : 1

Time	22 Sun	23 Mon	24 Tue	25 Wed	26 Thu	27 Fri	28 Sat	Wkday Avg.
01:00			24	24	21			23
02:00			9	15	10			11
03:00			3	2	6			4
04:00			0	1	2			1
05:00			4	4	5			4
06:00			5	6	3			5
07:00			16	11	16			14
08:00			55	43	47			48
09:00			102	96	93			97
10:00			68	72	72			71
11:00			67	64	55			62
12:00			82	65				74
13:00			84	100				92
14:00			104	91				98
15:00		117	110	106				111
16:00		123	142	138				134
17:00		205	208	188				200
18:00		337	336	318				330
19:00		198	227	193				206
20:00		141	139	148				143
21:00		111	117	89				106
22:00		74	86	109				90
23:00		64	57	55				59
24:00		40	40	52				44
Totals		1410	2085	1990	330			2027

AM Peak Hr	09:00	09:00	09:00
AM Count	102	96	93
PM Peak Hr	18:00	18:00	18:00
PM Count	337	336	318

AWD : _____
FAC : 1.001(.
ADT : 2010

5003

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

File : M1088044.PRN
ion : 99160324
ification : 113619
Town : WAYLAND
tion : RTE. 20. AT WAYLAND/WESTON T.L.

F.C. : 03
INV. : 19
Direction : Eastbound
Lane(s) : -

e	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
-					57			57
					33			33
					14			14
					30			30
					47			47
					227			227
					1043			1043
					1633			1633
					1298			1298
					850			850
					655			655
					636			636
					616			616
				670				670
				752				752
				901				901
				994				994
				987				987
				793				793
				507				507
				329				329
				324				324
				240				240
				142				142
s				6639	7139			13778
ak Hr					08:00			
unt					1633			
ak Hr				17:00	13:00			
unt				994	616			

AWD : 13778
FAC : .90(.98)
ADT : 12150

Comp. 27200

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary For week of October 23, 1988 ***

Data File : M1088044.PRN
Station : 99160304
Identification : 113619
City/Town : WAYLAND
Location : RTE. 20, AT WAYLAND/WESTON T.L.

F.C. : V3
INV. : 19
Direction : Westbound
Lane(s) : 2

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00					109			109
02:00					40			40
03:00					20			20
04:00					22			22
05:00					25			25
06:00					138			138
07:00					895			895
08:00					1732			1732
09:00					1364			1364
10:00					829			829
11:00					733			733
12:00					725			725
13:00					805			805
14:00				795	795			795
15:00				845				845
16:00				1171				1171
17:00				1352				1352
18:00				1525				1525
19:00				1355				1355
20:00				806				806
21:00				544				544
22:00				525				525
23:00				462				462
24:00				241				241
Totals				9621	8232			17058

AM Peak Hr		08:00
AM Count		1732
PM Peak Hr	18:00	13:00
PM Count	1525	805

AWD : 17052
FAC : .90(.96
ADT : 15054

5002

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1986 ***

File : M1088043.PRN
tion : 99130403
ification : 102819
/Town : WAYLAND
tion : RTE. 20, EAST OF RTES. 126/27

F.C. : 03
INV. : 19
Direction : Westbound
Lane(s) : 1

e	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
0					94			94
0					33			33
0					17			17
0					20			20
0					20			20
0					82			82
0					444			444
0					898			898
0					781			781
0					652			652
0					539			539
0					585			585
0					608			608
0				~~529~~	554			542
0				668	519			594
0				725	614			670
0				940				940
0				974				974
0				910				910
0				591				591
0				414				414
0				398				398
0				338				338
0				202				202
s				6689	6460			11346

ak Hr					08:00			
unt					898			
ak Hr				18:00	16:00			
unt				974	614			

AWD : 11346

Comb 19450

FAC : .90(.98)

ADT : 10000

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

Data File : r1088043.PRN
Station : 99150403
Identification : 102819
City/Town : WAYLAND
Location : RTE. 20, EAST OF RTES. 126/27

F.D. : 13
INV. : 19
Direction : Eastbound
Lane(s) : 2

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00					44			44
02:00					27			27
03:00					12			12
04:00					27			27
05:00					34			34
06:00					195			195
07:00					774			774
08:00					1073			1073
09:00					822			822
10:00					611			611
11:00					537			537
12:00					568			568
13:00					565			565
14:00				~~545~~	536			543
15:00				609	556			583
16:00				770	688			729
17:00				881				881
18:00				841				841
19:00				604				604
20:00				427				427
21:00				260				260
22:00				242				242
23:00				191				191
24:00				110				110
Totals				5484	7069			10700

AM Peak Hr		08:00
AM Count		1073
PM Peak Hr	17:00	16:00
PM Count	881	688

AWD : 10200
FAC : 92.95
ADT : 9450

(8) 315 5001

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 *** Page

File : m1088042.PRN
om : 93140102
ification : ~~126819~~
Town : WAYLAND
ion : RTES. 126/27. SOUTH OF RTE. 20

F.C. : 04
INV. : 20
Direction : Northbound
Lane(s) : 1

23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
				18			18
				13			13
				3			3
				5			5
				12			12
				52			52
				239			239
				653			653
				708			708
				487			487
				425			425
				522			522
				511			511
				552			552
			550	625			588
			683	696			690
			595				595
			704				704
			458				458
			309				309
			235				235
			212				212
			133				133
			42				42
			3921	5521			8166

k Hr 09:00
nt 708

k Hr 18:00 16:00
nt 704 696

AWD : 8166
FAC : .90 (.98)
ADT : 7200

Comb. 16200

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

*** Weekly Summary for week of October 23, 1988 *** Page

Data File : M1088042.PRN
Station : 99140102
Identification : 106819
City/Town : WAYLAND
Location : RTES. 126/27, SOUTH OF RTE. 20

F.C. : 04
INV. : 20
Direction : Southbound
Lane(s) : 2

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00					31			31
02:00					19			19
03:00					7			7
04:00					11			11
05:00					13			13
06:00					48			48
07:00					264			264
08:00					715			715
09:00					824			824
10:00					624			624
11:00					540			540
12:00					644			644
13:00					646			646
14:00				~~666~~	631			649
15:00				715	748			732
16:00				806	907			857
17:00				863				863
18:00				909				909
19:00				599				599
20:00				432				432
21:00				282				282
22:00				247				247
23:00				163				163
24:00				64				64
Totals				5746	6672			10183

AM Peak Hr		09:00
AM Count		824
PM Peak Hr	18:00	16:00
PM Count	909	907

AWD : 10183
FAC : .90 (.98)
ADT : 9000

SUDBURY

Lincoln Road, South of Old Sudbury Road, October, 1989
Concord Road (Route 126), South of Old Sudbury Road, October, 1989
Route 117 (North Road) at Concord/Sudbury Town Line, October, 1989
Concord Road at Concord/Sudbury Town Line, October, 1989
Dakin Road at Concord/Sudbury Town Line, October, 1989
Powers Road at Concord/Sudbury Town Line, October, 1989
Route 20, East of Old Colony Road, October 23, 1988
Route 20, East of Concord Road, October 23, 1988
Route 20, West of Nobscot Road, October 23, 1988
Route 20, East of Peakham Road, October 23, 1988

M1DD

AUTOMATIC TRAFFIC RECORDER COUNT - - SUMMARY

FOR: CENTRAL TRANSPORTATION PLANNING STAFF
BY: NORTHEAST TRAFFIC COUNTS
FILE: HAN-SUD-16 L-57 L:52 #260

LOCATION: LINCOLN ROAD
16 SOUTH OF OLD SUDBURY ROAD 58

CITY/TOWN: SUDBURY, MASSACHUSETTS 36

DATE: OCTOBER, 1989

TOTAL HOURLY TRAFFIC VOLUMES

	SUN	MON 10/2	TUE 10/3	WED 10/4	THUR 10/5	FRI	SAT	
12- 1A	-	-	0	0	0	-	-	12-1 A
1- 2	-	-	0	0	0	-	-	1-2
2- 3	-	-	0	0	0	-	-	2-3
3- 4	-	-	0	0	0	-	-	3-4
4- 5	-	-	0	0	0	-	-	4-5
5- 6	-	-	1	0	0	-	-	5-6
6- 7	-	-	2	0	0	-	-	6-7
7- 8	-	-	16	1	0	-	-	7-8
8- 9	-	-	19	17	0	-	-	8-9
9-10	-	-	11	22	12	-	-	9-10
10-11	-	-	9	7	18	-	-	10-11
11-12	-	-	17	10	14	-	-	11-12
12- 1P	-	9	12	10	-	-	-	12-1 P
1- 2	-	9	9	12	-	-	-	1-2
2- 3	-	15	11	8	-	-	-	2-3
3- 4	-	21	16	13	-	-	-	3-4
4- 5	-	19	14	12	-	-	-	4-5
5- 6	-	16	16	23	-	-	-	5-6
6- 7	-	14	18	11	-	-	-	6-7
7- 8	-	8	19	16	-	-	-	7-8
8- 9	-	2	7	6	-	-	-	8-9
9-10	-	4	8	3	-	-	-	9-10
10-11	-	4	6	3	-	-	-	10-11
11-12	-	1	0	0	-	-	-	11-12
TOTAL	0	122	211	174	44	0	0	TOTAL

AWD
184
.95(99)
ADT 173

208 5882

M19D

AUTOMATIC TRAFFIC RECORDER COUNT - - SUMMARY

FOR: CENTRAL TRANSPORTATION PLANNING STAFF
BY: NORTHEAST TRAFFIC COUNTS
FILE: HAN-SUD-17 L-57 L:52 #260

LOCATION: CONCORD ROAD (ROUTE 126)
17 SOUTH OF OLD SUDBURY ROAD G

CITY/TOWN: SUDBURY, MASSACHUSETTS U6

DATE: OCTOBER, 1989

TOTAL HOURLY TRAFFIC VOLUMES

	SUN	MON 10/2	TUE 10/3	WED 10/4	THUR 10/5	FRI	SAT	
12- 1A	-	-	21	15	21	-	-	12-1 A
1- 2	-	-	16	13	12	-	-	1-2
2- 3	-	-	4	5	3	-	-	2-3
3- 4	-	-	4	6	2	-	-	3-4
4- 5	-	-	11	4	6	-	-	4-5
5- 6	-	-	28	38	38	-	-	5-6
6- 7	-	-	257	244	266	-	-	6-7
7- 8	-	-	972	985	969	-	-	7-8
8- 9	-	-	935	878	1011	-	-	8-9
9-10	-	-	433	435	459	-	-	9-10
10-11	-	-	347	297	319	-	-	10-11
11-12	-	-	363	323	389	-	-	11-12
12- 1P	-	285	381	352	-	-	-	12-1 P
1- 2	-	283	356	370	-	-	-	1-2
2- 3	-	370	400	420	-	-	-	2-3
3- 4	-	469	520	520	-	-	-	3-4
4- 5	-	670	709	725	-	-	-	4-5
5- 6	-	918	957	865	-	-	-	5-6
6- 7	-	639	596	533	-	-	-	6-7
7- 8	-	259	288	295	-	-	-	7-8
8- 9	-	133	162	163	-	-	-	8-9
9-10	-	138	179	188	-	-	-	9-10
10-11	-	85	97	100	-	-	-	10-11
11-12	-	40	47	67	-	-	-	11-12
TOTAL	0	4289	8083	7841	3495	0	0	TOTAL

AWT
7903
.95(.99)
ADT 7433

288 S003

MIDD

AUTOMATIC TRAFFIC RECORDER COUNT - - SUMMARY

FOR: CENTRAL TRANSPORTATION PLANNING STAFF
BY: NORTHEAST TRAFFIC COUNTS
FILE: HAN-CON-19 L-57 L:52 #260

LOCATION: ROUTE 117 (NORTH ROAD)
19 AT CONCORD/SUDBURY TOWN LINE

Check

US

CITY/TOWN: CONCORD/SUDBURY, MASSACHUSETTS 36

DATE: OCTOBER, 1989

TOTAL HOURLY TRAFFIC VOLUMES

	SUN	MON 10/16	TUE 10/17	WED 10/18	THUR 10/19	FRI	SAT	
12- 1A	-	-	21	33	28	-	-	12-1 A
1- 2	-	-	14	13	14	-	-	1-2
2- 3	-	-	7	7	7	-	-	2-3
3- 4	-	-	7	9	7	-	-	3-4
4- 5	-	-	12	17	15	-	-	4-5
5- 6	-	-	137	165	161	-	-	5-6
6- 7	-	-	698	686	659	-	-	6-7
7- 8	-	-	1192	1026	1157	-	-	7-8
8- 9	-	-	886	870	-	-	-	8-9
9-10	-	-	431	444	-	-	-	9-10
10-11	-	-	307	362	-	-	-	10-11
11-12	-	-	342	379	-	-	-	11-12
12- 1P	-	-	401	388	-	-	-	12-1 P
1- 2	-	-	410	402	-	-	-	1-2
2- 3	-	-	404	412	-	-	-	2-3
3- 4	-	-	566	571	-	-	-	3-4
4- 5	-	-	745	761	-	-	-	4-5
5- 6	-	1073	928	1014	-	-	-	5-6
6- 7	-	525	657	657	-	-	-	6-7
7- 8	-	269	295	248	-	-	-	7-8
8- 9	-	207	225	226	-	-	-	8-9
9-10	-	183	190	196	-	-	-	9-10
10-11	-	144	164	158	-	-	-	10-11
11-12	-	68	54	63	-	-	-	11-12
TOTAL	0	~~2469~~	9093	9107	~~2048~~	0	0	TOTAL

9100
.95(.99)
9100

~~8857~~ 8559

MIDT

288 5004

AUTOMATIC TRAFFIC RECORDER COUNT - - SUMMARY

FOR: CENTRAL TRANSPORTATION PLANNING STAFF
BY: NORTHEAST TRAFFIC COUNTS
FILE: HAN-CON-18 L-57 L:52 #260

LOCATION: CONCORD ROAD
18 AT CONCORD/SUDBURY TOWN LINE 06

J6

Check

CITY/TOWN: CONCORD/SUDBURY, MASSACHUSETTS

DATE: OCTOBER, 1989

TOTAL HOURLY TRAFFIC VOLUMES

	SUN	MON 10/2	TUE 10/3	WED 10/4	THUR 10/5	FRI	SAT	
12- 1A	-	-	8	12	15	-	-	12-1 A
1- 2	-	-	3	4	7	-	-	1-2
2- 3	-	-	3	5	2	-	-	2-3
3- 4	-	-	0	2	2	-	-	3-4
4- 5	-	-	3	3	3	-	-	4-5
5- 6	-	-	26	24	23	-	-	5-6
6- 7	-	-	163	147	169	-	-	6-7
7- 8	-	-	504	474	494	-	-	7-8
8- 9	-	-	388	361	366	-	-	8-9
9-10	-	-	192	213	222	-	-	9-10
10-11	-	-	162	211	163	-	-	10-11
11-12	-	-	171	181	159	-	-	11-12
12- 1P	-	179	190	193	-	-	-	12-1 P
1- 2	-	137	188	177	-	-	-	1-2
2- 3	-	191	246	265	-	-	-	2-3
3- 4	-	251	315	294	-	-	-	3-4
4- 5	-	339	361	355	-	-	-	4-5
5- 6	-	424	484	482	-	-	-	5-6
6- 7	-	359	310	323	-	-	-	6-7
7- 8	-	132	155	176	-	-	-	7-8
8- 9	-	77	91	98	-	-	-	8-9
9-10	-	74	91	108	-	-	-	9-10
10-11	-	45	53	68	-	-	-	10-11
11-12	-	34	28	38	-	-	-	11-12
TOTAL	0	2242	4135	4214	1625	0	0	TOTAL

AWT

4072

.95(44)

~~DOT~~ 3830

288 S005

MID

AUTOMATIC TRAFFIC RECORDER COUNT - - SUMMARY

FOR: CENTRAL TRANSPORTATION PLANNING STAFF
BY: NORTHEAST TRAFFIC COUNTS
FILE: HAN-CON-20 L-57 L:52 #260

LOCATION: DAKIN ROAD
20 AT CONCORD/SUDBURY TOWN LINE

V6

CITY/TOWN: CONCORD/SUDBURY, MASSACHUSETTS 48

DATE: OCTOBER, 1989

check

TOTAL HOURLY TRAFFIC VOLUMES

	SUN	MON 10/2	TUE 10/3	WED 10/4	THUR 10/5	FRI	SAT	
12- 1A	-	-	9	10	3	-	-	12-1 A
1- 2	-	-	0	0	0	-	-	1-2
2- 3	-	-	0	2	0	-	-	2-3
3- 4	-	-	2	3	3	-	-	3-4
4- 5	-	-	1	0	0	-	-	4-5
5- 6	-	-	11	20	15	-	-	5-6
6- 7	-	-	85	93	87	-	-	6-7
7- 8	-	-	222	235	230	-	-	7-8
8- 9	-	-	222	151	167	-	-	8-9
9-10	-	-	104	111	123	-	-	9-10
10-11	-	-	84	82	80	-	-	10-11
11-12	-	~~53~~	115	84	98	-	-	11-12
12- 1P	-	72	105	81	-	-	-	12-1 P
1- 2	-	92	81	102	-	-	-	1-2
2- 3	-	108	105	90	-	-	-	2-3
3- 4	-	156	166	155	-	-	-	3-4
4- 5	-	160	172	169	-	-	-	4-5
5- 6	-	207	211	197	-	-	-	5-6
6- 7	-	149	125	185	-	-	-	6-7
7- 8	-	101	89	91	-	-	-	7-8
8- 9	-	64	41	76	-	-	-	8-9
9-10	-	55	49	37	-	-	-	9-10
10-11	-	34	30	30	-	-	-	10-11
11-12	-	13	18	18	-	-	-	11-12
TOTAL	0	~~1264~~ 1211	2047	2022	806	0	0	TOTAL

AWT
2029
.95(.92)
ADT 1908

288 S006

MID

AUTOMATIC TRAFFIC RECORDER COUNT - - SUMMARY

FOR: CENTRAL TRANSPORTATION PLANNING STAFF
BY: NORTHEAST TRAFFIC COUNTS
FILE: HAN-CON-21 L-57 L:52 #260

LOCATION: POWERS ROAD
21 AT CONCORD/SUDBURY TOWN LINE 77

CITY/TOWN: CONCORD/SUDBURY, MASSACHUSETTS

DATE: OCTOBER, 1989 UO

TOTAL HOURLY TRAFFIC VOLUMES

	SUN	MON 10/2	TUE 10/3	WED 10/4	THUR 10/5	FRI	SAT	
12- 1A	-	-	4	1	4	-	-	12-1 A
1- 2	-	-	0	0	1	-	-	1-2
2- 3	-	-	0	1	0	-	-	2-3
3- 4	-	-	0	0	0	-	-	3-4
4- 5	-	-	0	1	0	-	-	4-5
5- 6	-	-	9	5	7	-	-	5-6
6- 7	-	-	26	23	28	-	-	6-7
7- 8	-	-	97	96	88	-	-	7-8
8- 9	-	-	108	104	78	-	-	8-9
9-10	-	-	37	54	45	-	-	9-10
10-11	-	-	37	28	37	-	-	10-11
11-12	-	~~35~~	26	44	29	-	-	11-12
12- 1P	-	42	50	41	-	-	-	12-1 P
1- 2	-	28	36	38	-	-	-	1-2
2- 3	-	35	47	57	-	-	-	2-3
3- 4	-	56	47	59	-	-	-	3-4
4- 5	-	71	70	68	-	-	-	4-5
5- 6	-	54	82	77	-	-	-	5-6
6- 7	-	59	64	85	-	-	-	6-7
7- 8	-	38	48	44	-	-	-	7-8
8- 9	-	36	38	53	-	-	-	8-9
9-10	-	26	29	17	-	-	-	9-10
10-11	-	8	19	16	-	-	-	10-11
11-12	-	5	9	11	-	-	-	11-12
TOTAL	0	~~493~~ 458	883	923	317	0	0	TOTAL

860
.95(.99)
ADT 809

AWT
860

288 5004

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary For week of October 23, 1988 ***

File : M1088047.PRN
on : 99800403
ification : 114419
Town : SUDBURY
ion : RTE. 20, EAST OF OLD COLONY RD.

F.C. : 03
INV. : 20
Direction : Eastbound
Lane(s) : 2

	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
					50			50
					26			26
					11			11
					23			23
					35			35
					184			184
					717			717
					1314			1314
					877			877
					589			589
					581			581
					674			674
					754			754
					689			689
				673	595			634
				713	653			683
				915				915
				837				837
				669				669
				448				448
				296				296
				264				264
				195				195
				94				94
s				5104	7772			11559
ak Hr					08:00			
unt					1314			
ak Hr				17:00	13:00			
unt				915	754			

AWD : 11559
FAC : .90 (.98)
ADT : 10200

Comb 19100

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

Page

Data File : M1088047.PRN
Station : 99200403
Identification : 114419
City/Town : SUDBURY
Location : RTE. 20, EAST OF OLD COLONY RD.

F.C. : 03
INV. : 70
Direction : Westbound
Lane(s) : 1

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00					93			93
02:00					31			31
03:00					14			14
04:00					9			9
05:00					16			16
06:00					56			56
07:00					256			256
08:00					515			515
09:00					537			537
10:00					555			555
11:00					549			549
12:00					690			690
13:00					679			679
14:00					553			553
15:00				656	571			614
16:00				764	692			728
17:00				1079				1079
18:00				895				895
19:00				780				780
20:00				482				482
21:00				361				361
22:00				293				293
23:00				196				196
24:00				138				138
Totals				5644	5816			10119

AM Peak Hr		12:00
AM Count		690
PM Peak Hr	17:00	16:00
PM Count	1079	692

AWD : 10119
FAC : .90 (.98)
ADT : 8900

288 S003

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

File : M1088046.PRN
Dm : 99190403
ification : 101019
Town : SUDBURY
ion : RTE. 20. EAST OF CONCORD RD.

F.C. : V3
INV. : 20
Direction : Westbound
Lane(s) : 1

23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
				93			93
				25			25
				9			9
				13			13
				15			15
				60			60
				282			282
				632			632
				699			699
				589			589
				653			653
				696			696
				785			785
				645			645
			713	715			714
			811	711			761
			887				887
			797				797
			730				730
			533				533
			400				400
			345				345
			233				233
			145				145
			5594	6622			10741

ak Hr 09:00
ant 699

ak Hr 17:00 13:00
ant 887 785

AWD : 10741
FAC : .90 (.98)
ADT : 9450

Comb. 20900

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

Data File : M1088046.PRN
Station : 99190403
Identification : 101019
City/Town : SUDBURY
Location : RTE. 20. EAST OF CONCORD RD.

F.C. : 13
INV. : 70
Direction : Eastbound
Lane(s) : 2

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00					44			44
02:00					28			28
03:00					10			10
04:00					21			21
05:00					41			41
06:00					157			157
07:00					629			629
08:00					1114			1114
09:00					978			978
10:00					722			722
11:00					725			725
12:00					755			755
13:00					918			918
14:00					815			815
15:00				732	750			741
16:00				830	908			869
17:00				1065				1065
18:00				1048				1048
19:00				811				811
20:00				552				552
21:00				387				387
22:00				289				289
23:00				187				187
24:00				94				94
Totals				5995	8615			13000

AM Peak Hr		08:00
AM Count		1114
PM Peak Hr	17:00	13:00
PM Count	1065	918

AWD : 13000
FAC : _____
ADT : 11450

288 5002

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

File : M1088045.PRN
: 99180403
tification : 134719
Town : SUDBURY
tion : RTE. 20, WEST OF NOBSCOT RD.

F.C. : 13
INV. : 70
Direction : Eastbound
Lane(s) : 2

	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
2					43			43
2					24			24
2					13			13
2					18			18
2					38			38
2					158			158
2					550			550
2					855			855
2					752			752
2					585			585
2					661			661
2					742			742
2					811			811
2					742			742
2					707			707
2				827	834			831
2				926				926
2				969				969
2				583				583
2				473				473
2				339				339
2				235				235
2				179				179
2				77				77
				4608	7533			11311
k Hr					08:00			
nt					855			
k Hr				18:00	16:00			
nt				969	834			

AWD : 11311
FAC : .90 (.98)
ADT : 10000

Comb. 20250

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 23, 1988 ***

Data File : m1088045.PRN
Station : 99180403
Identification : 134719
City/Town : SUDBURY
Location : RTE. 20, WEST OF NOBSCOT RD.

F.C. : 13
INV. : 20
Direction : Westbound
Lane(s) : 1

Time	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
01:00					79			79
02:00					23			23
03:00					13			13
04:00					8			8
05:00					19			19
06:00					67			67
07:00					279			279
08:00					727			727
09:00					763			763
10:00					587			587
11:00					671			671
12:00					772			772
13:00					913			913
14:00					778			778
15:00					711			711
16:00				826	783			805
17:00				918				918
18:00				940				940
19:00				805				805
20:00				587				587
21:00				415				415
22:00				358				358
23:00				210				210
24:00				154				154
Totals				5213	7193			11602

AM Peak Hr		12:00
AM Count		772
PM Peak Hr	18:00	13:00
PM Count	940	913

AWD : 11602
FAC : _____
ADT : 10250

(8) 268 500/

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

*** Weekly Summary for week of October 23, 1988 ***

File : Y1088071.PRN F.C. : U3
ion : 88170403 Inv. : 70
ification : 106213 Direction : Eastbound
Town : SUDBURY Lane(s) : 3
tion : RTE. 20, EAST OF PEAKHAM RD.

	23 Sun	24 Mon	25 Tue	26 Wed	27 Thu	28 Fri	29 Sat	Wkday Avg.
					38	45	83	42
					31	37	61	34
					10	29	32	20
					21	16	23	19
					31	37	22	34
					186	175	59	181
					685	670	188	678
					1048	1108	315	1078
					966	912	376	935
					504	591	486	548
					519	550	601	535
					520	551	611	536
					598	572	648	585
					605	602	662	604
					556	603	673	580
				590	604	653	662	616
				644	598	641	632	628
				653	679	632	545	655
				491	555	528	441	525
				350	447	409	379	402
				261	311	324	335	299
				210	201	229	227	213
				193	196	193	216	194
				89	107	155	182	117
ls				3481	10016	10262	8359	10062

eak Hr		08:00	08:00	12:00
ount		1048	1108	611
eak Hr	18:00	18:00	16:00	15:00
ount	653	679	653	673

AWD : 10139
FAC : .90(-98)
Comb. 17550 ADT : 8950

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 30, 1988 ***

Data File : M108807I.PRN
Station : 99170403
Identification : 106219
City/Town : SUDBURY
Location : RTE. 20, EAST OF PEAKHAM RD.

F.C. : V3
INV. : _____
Direction : Westbound
Lane(s) : 1

Time	30 Sun	31 Mon	Tue	Wed	Thu	Fri	Sat	Wkday Avg.
01:00	167	100						100
02:00	120	46						46
03:00	53	18						18
04:00	24	6						6
05:00	6	3						3
06:00	11	11						11
07:00	23	42						42
08:00	41	202						202
09:00	103	517						517
10:00	152	491						491
11:00	293	423						423
12:00	307	444						444
13:00	461	563						563
14:00	659	570						570
15:00	773							
16:00	627							
17:00	602							
18:00	484							
19:00	489							
20:00	353							
21:00	262							
22:00	213							
23:00	•147							
24:00	115							
Totals	6485	3436						3436

AM Peak Hr	12:00	09:00
AM Count	307	517
PM Peak Hr	15:00	14:00
PM Count	773	570

AWD : _____

FAC : _____

ADT : _____

MARLBOROUGH

Route 20, West of Wayside Inn Road, October 30, 1988
Route 20, West of Wilson Street, October 30, 1988
Route 20, East of Curtis Avenue, October 30, 1988
Route 20, East of Route 85, October 30, 1988
Route 85, North of Route 20, October 30, 1988
Route 20, East of Route I-495, November 3, 1988
Route 20, Between Felton Street and Route I-495, November 3, 1988
Route 20, East of Route I-495, November 3, 1988
Forest Street Under I-495, November 3, 1988
Route 20 at Marlborough/Northborough Town Line, November 3, 1988
Ramps, Route I-495 S.B. to Route 20 W.B., November 3, 1988
Ramps Route I-495 N.B. to Route 20 W.B., November 3, 1988
Ramp, Route 20 E.B. to Route I-495 S.B., November 3, 1988
Ramp, Route 20 E.B. to Route I-495 N.B., November 3, 1988

170 5008

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 30, 1988 ***

File : M1088070.PRN
ion : 99890403
ification : 134719
/Town : MARLBOROUGH
tion : RTE. 20. WEST OF WAYSIDE INN RD.

F.C. : U3
INV. : 191
Direction : Eastbound
Lane(s) : 2

	30 Sun	31 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	Wkday Avg.
1			34					34
2			26					26
3			19					19
4			16					16
5			29					29
6			163					163
7			655					655
8			943					943
9			789					789
10			437					437
11			428					428
12			443					443
			430					430
			429					429
		456	403					430
		476	449					463
		615						615
		625						625
		311						311
		210						210
		172						172
		131						131
		110						110
		59						59
Ls		3165	5693					7967

eak Hr 08:00
ount 943

eak Hr 18:00 16:00
ount 625 449

AWD : 7967
FAC : 90.90
Comb. 14000 ADT : 2050

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary For week of October 30, 1988 ***

Data File : M1088077.PRN
Station : 99290403
Identification : 134719
Div/Town : MARLBOROUGH
Location : RTE. 20, WEST OF WAYSIDE INN RD.
Boston Post Rd

F.C. : 13
INV. : 191
Direction : Westbound
Lane(s) : 1

Time	30 Sun	31 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00			81					81
02:00			27					27
03:00			16					16
04:00			5					5
05:00			12					12
06:00			49					49
07:00			198					198
08:00			517					517
09:00			484					484
10:00			397					397
11:00			361					361
12:00			478					478
13:00			515					515
14:00			478					478
15:00		500	455					478
16:00		680	581					631
17:00		846						846
18:00		813						813
19:00		470						470
20:00		332						332
21:00		251						251
22:00		210						210
23:00		134						134
24:00		122						122
Totals		4358	4654					7905

AM Peak Hr		08:00
AM Count		517
PM Peak Hr	17:00	16:00
PM Count	846	581

AWD : 7905
FAC : .90 (.98)
ADT : 6950

170 5007

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 30, 1988 ***

File : M1088063.PRN
on : 93280403
ification : 102819
own : MARLBOROUGH
ion : RTE. 20, WEST OF WILSON ST.
Boston Post Rd

F.C. : 03
INV. : 191
Direction : Eastbound
Lane(s) : 3

30 Sun	31 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	Wkday Avg.
		65					65
		34					34
		19					19
		27					27
		35					35
		184					184
		641					641
		855					855
		804					804
		627					627
		579					579
		612					612
		685					685
		622					622
	674	584					629
	651	558					605
	656						656
	676						676
	470						470
	401						401
	308						308
	253						253
	176						176
	73						73
	4338	6931					10036

k Hr 08:00
nt 855

k Hr 18:00 13:00
nt 676 685

AWD : 10036
FAC : .90 (.98)
ADT : 8850

Comb 18900

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary For week of October 30, 1988 ***

Data File : M1088069.PRN
Station : 99280403
Identification : 102819
City/Town : MARLBOROUGH
Location : RTE. 20, WEST OF WILSON ST.
F.C. : 03
INV. : 191
Direction : Westbound
Lane(s) : 1

Time	30 Sun	31 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00			87					87
02:00			43					43
03:00			16					16
04:00			10					10
05:00			19					19
06:00			69					69
07:00			242					242
08:00			534					534
09:00			589					589
10:00			561					561
11:00			575					575
12:00			746					746
13:00			758					758
14:00		~~799~~	745					772
15:00		807	679					743
16:00		997	873					935
17:00		1183						1183
18:00		1174						1174
19:00		703						703
20:00		541						541
21:00		387						387
22:00		338						338
23:00		217						217
24:00		163						163
Totals		7309	6546					11405

AM Peak Hr 12:00
AM Count 746

PM Peak Hr 17:00 16:00
PM Count 1183 873

AWD : 11405
FAC : .90 (.98)
ADT : 10050

170 5006

DIVISION OF ASSET MGMT
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for Week of October 31, 1988 ***

Page

Site Type : 12BZZ1.1BX
Site : 3587022
Control Location : 1354_E
Road Name : MARLBOROUGH
Location : RTE. 85, EAST OF CURTIS AVE.
COMBINED

D.C. : 04
Lane(s) : _
Direction : Eastbound
Inv. : 21

Date	00 Sun	01 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	AKDay Ave.
22			83					83
23			49					49
24			31					31
25			33					33
26			37					37
27			34					34
28			321					321
29			919					919
30			813					813
31			799					799
01			656					656
02			781					781
03			837					837
04			699					699
05		614	812					713
06		881	809					845
07		1042						1042
08		1196						1196
09		822						822
10		589						589
11		481						481
12		387						387
13		264						264
14		167						167
Totals		6443	8013					12898

Peak Hr		08:00
Count		919
Peak Hr	18:00	13:00
Count	1196	837

Comb. 23950

AWD : 12898
FAC : .90 (.98)
ADT : 11400

[illegible] OF TRANSPORTATION
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

*** Weekly Summary for Week of October 27, 1988 ***

Page

Data File	: M1088701.PRN	F.D.	: LF
Station	: 00870014	Dir.	: 21
Description	: LOCATION	Direction	: Westbound
City/Town	: CARLSTADT	Lane(s)	: 1
Location	: RTE. 20, EAST OF CURTIS AVE.		

Time	30 Sun	31 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00			80					80
02:00			50					50
03:00			32					32
04:00			21					21
05:00			31					31
06:00			133					133
07:00			469					469
08:00			1028					1028
09:00			944					944
10:00			813					813
11:00			708					708
12:00			865					865
13:00			869					869
14:00			823					823
15:00		671	800					736
16:00		1144	866					1005
17:00		1260						1260
18:00		1234						1234
19:00		956						956
20:00		734						734
21:00		594						594
22:00		391						391
23:00		287						287
24:00		194						194
Totals		7465	8532					14257

AM Peak Hr		08:00
AM Count		1028
PM Peak Hr	17:00	13:00
PM Count	1260	869

AWD : 14257

FAC : .90 (.9)

ADT : 12550

170 5005

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary For week of October 30, 1988 ***

File : M1088067.PRN
tion : 99260403
ification : 136819
Town : MARLBOROUGH
tion : RTE. 30, EAST OF RTE. 85

F.C. : 13
INV. : 24
Direction : Eastbound
Lane(s) : 2

30 Sun	31 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	Wkday Avg.
		39					39
		22					22
		9					9
		15					15
		11					11
		66					66
		217					217
		481					481
		402					402
		357					357
		338					338
		382					382
		436					436
		374					374
		374					374
	519	423					471
	587						587
	715						715
	357						357
	253						253
	208						208
	157						157
	108						108
	69						69
	2973	3946					6448

Peak Hr		08:00
Count		481
Peak Hr	18:00	13:00
Count	715	436

AWD : 6448
FAC : .90(.98)
ADT : 5700

Comb. 13300

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 30, 1988 ***

Data File : M1088067.PRN
Station : 99602403
Identification : 136819
Div/Town : MARLBOROUGH
Location : RTE. 20, EAST OF RTE. 85 LINCOLN ST

F.C. : 03
INV. : 27
Direction : Westbound
Lane(s) : 1

Time	30 Sun	31 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00			47					47
02:00			28					28
03:00			16					16
04:00			14					14
05:00			22					22
06:00			73					73
07:00			350					350
08:00			763					763
09:00			734					734
10:00			482					482
11:00			450					450
12:00			545					545
13:00			637					637
14:00			619					619
15:00			590					590
16:00		598	554					576
17:00		674						674
18:00		725						725
19:00		397						397
20:00		324						324
21:00		236						236
22:00		151						151
23:00		110						110
24:00		52						52
Totals		3267	5924					8615

AM Peak Hr		08:00
AM Count		763
PM Peak Hr	18:00	13:00
PM Count	725	637

AWD : 8615
FAC : .90 (.98)
ADT : 7600

Not Posted S.S.?

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of October 30, 1988 *** Page -

File : M1088066.PRN
ion : 99250102
tification : 137119
/Town : MARLBOROUGH
tion : RTE. 85, NORTH OF RTE. 20 BOLTON ST

F.C. : US
INV. : 88
Direction : Northbound
Lane(s) : 1

e	30 Sun	31 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	Wkday Avg.
-			59					59
			18					18
			12					12
			7					7
			5					5
			20					20
			140					140
			341					341
			454					454
			336					336
			307					307
			335					335
			421					421
			345					345
		392	353					373
		554	483					519
		641						641
		561						561
		357						357
		258						258
		178						178
		154						154
		107						107
		79						79
s		3281	3636					6027

ak Hr		09:00
unt		454
ak Hr	17:00	16:00
unt	641	483

AWD : _____

FAC : _____

ADT : _____

NOT POSTED

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary For week of October 30, 1988 ***

Data File : M1088066.PRN
Station : 99250102
Identification : 137119
City/Town : MARLBOROUGH
Location : RTE. 85. NORTH OF RTE. 20 BOLTON

F.C. : 05
INV. : 88
Direction : Southbound
Lane(s) : 2

Time	30 Sun	31 Mon	1 Tue	2 Wed	3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00			17					17
02:00			8					8
03:00			9					9
04:00			7					7
05:00			15					15
06:00			76					76
07:00			136					136
08:00			205					205
09:00			198					198
10:00			165					165
11:00			141					141
12:00			113					113
13:00			88					88
14:00			89					89
15:00		141						141
16:00		307						307
17:00		297						297
18:00		394						394
19:00		217						217
20:00		200						200
21:00		140						140
22:00		102						102
23:00		76						76
24:00		43						43
Totals		1917	1267					3184

AM Peak Hr		08:00
AM Count		205
PM Peak Hr	18:00	14:00
PM Count	394	89

AWD : _____

FAC : _____

ADT : _____

170 5004

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for Week of November 3, 1986 ***

File : WL188035.PRN
Item : 98240324
Identification : 101410
Within : MARLBORO-
Location : RTE. 20, EAST OF RTE. I-495 LAKESIDE AVE.

F.C. : 03
INV. : 146
Direction : Eastbound
Lane(s) : 1

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
00						107		107
01						88		88
02						32		32
03						29		29
04						23		23
05						97		97
06						502		502
07						1274		1274
08						1502		1502
09						795		795
10						599		599
11						759		759
12						845		845
13					702	739		721
14					691			691
15					844			844
16					931			931
17					979			979
18					775			775
19					562			562
20					383			383
21					354			354
22					314			314
23					197			197
Totals					6732	7391		13403
Peak Hr						09:00		
Count						1502		
Peak Hr					18:00	13:00		
Count					979	845		

AWD : 13403
FAC : .98 (.98)
ADT : 12850

Comb. 26750

170 5002

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for Week of November 2, 1988 ***

Data File : W1_88058.PRN
Station : 88020034
Identification : 1.4413
City/Town : WORCESTER
Location : RTE. 20, BETWEEN FELTON ST. & RTE. I-495 BOSTON POST RD

F.D. : 03
INV. : 191
Direction : Eastbound
Lane(s) : ..

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00						144		144
02:00						122		122
03:00						65		65
04:00						42		42
05:00						32		32
06:00						113		113
07:00						454		454
08:00						840		840
09:00						760		760
10:00						660		660
11:00						658		658
12:00						886		886
13:00					922	989		956
14:00					812	884		848
15:00					939			939
16:00					1313			1313
17:00					1549			1549
18:00					1843			1843
19:00					1014			1014
20:00					657			657
21:00					440			440
22:00					390			390
23:00					297			297
24:00					288			288
Totals					10464	6649		15310

AM Peak Hr		12:00
AM Count		886
PM Peak Hr	18:00	13:00
PM Count	1843	989

AWD : 153
FAC : 90.1
ADT : 1350

Comb. 27650

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT
*** Weekly Summary For Week of November 3, 1998 ***

Page

File : V1138003.PRN
Dist : 03222324
Classification : 1144.0
Arrow : MARLBOROUGH
Location : RTE. 20, BETWEEN FELTON ST. & RTE. I-495

F.D. V3
Dir. 191
Direction Westbound
Lane(s) 2

Day	5 Sun	6 Mon	7 Tue	8 Wed	9 Thu	10 Fri	11 Sat	Wkday Avg.
00						117		117
01						77		77
02						45		45
03						36		36
04						48		48
05						151		151
06						729		729
07						1528		1528
08						1678		1678
09						940		940
10						756		756
11						966		966
12					953	1094		1024
13					1011	1029		1020
14					975			975
15					945			945
16					1004			1004
17					1205			1205
18					803			803
19					550			550
20					469			469
21					405			405
22					355			355
23					242			242
Totals					8917	9194		16068

Peak Hr		09:00
Count		1678
Peak Hr	18:00	13:00
Count	1205	1094

AWD : 16068
FAC : .90(.91)
ADT : 14150

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for Week of November 3, 1998 ***

Data File : M1183003.PRN
Station : 99240324
Identification : 10149
Dir/Char : MAR_BOROUG-
Location : RTE. 20, EAST OF RTE. I-495

F.C. : 13
INV. : 146
Direction : Westbound
Lane(s) : 3

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00						106		106
02:00						55		55
03:00						43		43
04:00						20		20
05:00						46		46
06:00						123		123
07:00						492		492
08:00						980		980
09:00						1009		1009
10:00						660		660
11:00						660		660
12:00						886		886
13:00						1029		1029
14:00					858	936		897
15:00					818			818
16:00					982			982
17:00					1361			1361
18:00					1474			1474
19:00					912			912
20:00					550			550
21:00					464			464
22:00					407			407
23:00					282			282
24:00					202			202
Totals					8310	7045		14458

AM Peak Hr		09:00
AM Count		1009
PM Peak Hr	18:00	13:00
PM Count	1474	1029

AWD : 14445
FAC : .98 C.9
ADT : 13900

170 S003

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of November 3, 1988 ***

File : M1188037.PRN
tion : 99220403
ification : 136819
Town : MARLBOROUGH
ation : FOREST ST. UNDER I-495

F.C. : U6
INV. : 244
Direction : Westbound
Lane(s) : 1

	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
0						4		4
1						1		1
2						4		4
3						4		4
4						5		5
5						44		44
6						207		207
7						612		612
8						1116		1116
9						298		298
10						166		166
11					174	171		173
12					406	344		375
13					338	330		334
14					185			185
15					169			169
16					149			149
17					165			165
18					53			53
19					46			46
20					20			20
21					31			31
22					28			28
23					17			17
Tots					1781	3306		4206

Peak Hr 12:00 09:00
Count 174 1116

Peak Hr 13:00 13:00
Count 406 344

AWD : 4206
FAC : 102(.99)
ADT : 4250

Comb. 9350

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for Week of November 3, 1988 ***

Page

Data File : M1188037.PRN
Station : 99220403
Identification : 136819
Div/Town : MARLBOROUGH
Location : FOREST ST. UNDER I-495

F.C. : J6
INV. : 244
Direction : Eastbound
Lane(s) : 2

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00						18		18
02:00						6		6
03:00						11		11
04:00						4		4
05:00						2		2
06:00						25		25
07:00						107		107
08:00						307		307
09:00						565		565
10:00						181		181
11:00						147		147
12:00					416	443		430
13:00					459	414		437
14:00					285	284		285
15:00					235			235
16:00					421			421
17:00					595			595
18:00					717			717
19:00					242			242
20:00					102			102
21:00					57			57
22:00					57			57
23:00					57			57
24:00					43			43
Totals					3686	2514		5051

AM Peak Hr	12:00	09:00
AM Count	416	565
PM Peak Hr	18:00	13:00
PM Count	717	414

AWD : 5051
FAC : 1.02
ADT : 5100

(8) 170 5001

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of November 3, 1988 *** Page

File : M1138035.PRN F.C. : U3
ion : 99210304 INV. : 191
Station : 137113 Direction : Eastbound
Town : MARLBOROUGH Lane(s) : 1
tion : RTE. 20, AT MARLBOROUGH/NORTHBOROUGH T/L
BOSTON POST RD.

6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
					42		42
					38		38
					50		50
					20		20
					18		18
					96		96
					398		398
					829		829
					823		823
					385		385
					319		319
				377	334		356
				585	566		576
				461	460		461
				435			435
				431			431
				394			394
				398			398
				291			291
				259			259
				177			177
				123			123
				116			116
				109			109
				4156	4378		7144

ak Hr		12:00	08:00
nt		377	829
ak Hr		13:00	13:00
nt		585	566

AWD : 7144
FAC : .90698
ADT : 6300

Comb. 11950

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

*** Weekly Summary for week of November 3, 1988 ***

Data File : V1188036.PRN
Station : 99210304
Identification : 137119
Town : MARLBOROUGH
Location : RTE. 20, AT MARLBOROUGH/NORTHBOROUGH T/L

F.C. : 03
INV. : 191
Direction : Westbound
Lane(s) : 2

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00						55		55
02:00						45		45
03:00						24		24
04:00						19		19
05:00						24		24
06:00						41		41
07:00						122		122
08:00						258		258
09:00						270		270
10:00						221		221
11:00						282		282
12:00					375	430		403
13:00					481	526		504
14:00					352	452		402
15:00					392			392
16:00					481			481
17:00					608			608
18:00					825			825
19:00					481			481
20:00					300			300
21:00					215			215
22:00					193			193
23:00					133			133
24:00					90			90
Totals					4926	2769		6388

AM Peak Hr	12:00	12:00
AM Count	375	430
PM Peak Hr	18:00	13:00
PM Count	825	526

AWD : 6388
FAC : .88(.98)
ADT : 5650

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for Week of November 3, 1988 ***

File : 118843.PRN
F.C. : ____
Loc : 093202
Inv. : _____
Location : 185.9
Direction : Inbound
City/Town : MARLBOROUGH
Lane(s) : 4
Route : RTE. 495 S.B. TO RTE. 20 W.B.

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
:00						30		30
:15						39		39
:30						19		19
:45						22		22
1:00						20		20
1:15						66		66
1:30						318		318
1:45						558		558
2:00						713		713
2:15						347		347
2:30						242		242
2:45						278		278
3:00					259	298		279
3:15					273	300		287
3:30					280			280
3:45					307			307
4:00					275			275
4:15					326			326
4:30					187			187
4:45					119			119
5:00					110			110
5:15					84			84
5:30					123			123
5:45					65			65
Totals					2408	3390		5234
Peak Hr						09:00		
Count						713		
Peak Hr					18:00	14:00		
Count					326	300		

AWD : _____

FAC : _____

ADT : _____

[illegible] OF MARYLAND - DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION - PLANNING AND DEVELOPMENT
*** Weekly Summary for Week of November 2, 1986 ***

Data File	: 11138046.PRN	F.C.	: ____
Station	: 000120	Dir.	: _____
Permanent Location	: 0062.9	Direction	: Combined
City/Town	: WESTMINSTER	Lane(s)	: ..
Location	: RAMPS, RTE. 32 W.B. TO RTE. 140 E.B.		

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
1:00						15		15
2:00						16		16
3:00						11		11
4:00						6		5
5:00						20		20
6:00						40		40
7:00						105		105
8:00						374		374
9:00						239		239
10:00						173		173
11:00						164		164
12:00						166		166
13:00					204	209		207
14:00					183	215		199
15:00					218			218
16:00					284			284
17:00					397			397
18:00					416			416
19:00					209			209
20:00					106			106
21:00					78			78
22:00					96			96
23:00					78			78
24:00					39			39
Totals					2308	1843		3746

AM Peak Hr		08:00
AM Count		374
PM Peak Hr	18:00	14:00
PM Count	416	215

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for Week of November 3, 1988 *** Page .

File : M1188047.PRN F.C. : ____
Loc : 993800 INV. : _____
Classification : 125918 Direction : Combined
Town : MARLBOROUGH Lane(s) : _
Location : RAMP. RTE. I-495 N.B. TO RTE. 20 W.B.

	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
						17		17
						15		15
						6		6
						5		5
						9		9
						34		34
						237		237
						542		542
						594		594
						289		289
						173		173
						221		221
						207		207
					242	288		265
					217			217
					210			210
					227			227
					294			294
					157			157
					94			94
					72			72
					69			69
					75			75
					49			49
					1706	2637		4078

Peak Hr 09:00
Count 594

Peak Hr 18:00 14:00
Count 294 288

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of November 3, 1988 ***

Data File : M1188048.PRN
Station : 993320
Identification : 107719
City/Town : MARLBOROUGH
Location : RAMP, RTE. 20 W.B. TO RTE. I-495 N.B.

F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00						27		27
02:00						23		23
03:00						16		16
04:00						1		1
05:00						17		17
06:00						78		78
07:00						214		214
08:00						409		409
09:00						383		383
10:00						249		249
11:00						227		227
12:00						267		267
13:00					312	274		293
14:00					308	305		307
15:00					289			289
16:00					457			457
17:00					703			703
18:00					702			702
19:00					348			348
20:00					167			167
21:00					136			136
22:00					114			114
23:00					86			86
24:00					64			64
Totals					3686	2490		5577

AM Peak Hr		08:00
AM Count		409
PM Peak Hr	17:00	14:00
PM Count	703	305

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

*** Weekly Summary for week of November 3, 1988 ***

File : M1188049.PRN
F.C. : ____
tion : 993400
INV. : _____
cification : 134713
Direction : Combined
Town : MARLBOROUGH
Lane(s) : 1
tion : RAMP. RTE. 20 E.B. TO RTE. I-495 S.B.

	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
27						32		32
23						17		17
15						8		8
1						10		10
17						8		8
13						39		39
14						150		150
05						255		255
13						232		232
49						176		176
27						192		192
57						261		261
33					237	264		251
07					219	252		236
39					305			305
57					416			416
03					541			541
02					656			656
48					319			319
37					168			168
15					117			117
14					97			97
16					53			53
34					66			66
77	ds				3194	1896		4605

eak Hr		12:00
Count		261
eak Hr	18:00	13:00
Count	656	264

AWD : _____

FAC : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of November 3, 1988 ***

Data File : M1188050.PRN
Station : 993500
Identification : 102819
City/Town : MARLBOROUGH
Location : RAMP. RTE. I-495 S.B. TO RTE. 20 E.B.

F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00						26		26
02:00						12		12
03:00						6		6
04:00						7		7
05:00						6		6
06:00						32		32
07:00						192		192
08:00						594		594
09:00						717		717
10:00						288		288
11:00						190		190
12:00						195		195
13:00					222	189		206
14:00					166	188		177
15:00					211			211
16:00					234			234
17:00					284			284
18:00					303			303
19:00					232			232
20:00					101			101
21:00					81			81
22:00					95			95
23:00					75			75
24:00					44			44
Totals					2048	2642		4308

AM Peak Hr		09:00
AM Count		717
PM Peak Hr	18:00	13:00
PM Count	303	189

AWD : _____

FAC : _____

ADT : _____

[illegible] OF [illegible] AVENUE
BUREAU OF [illegible] PLANNING AND DEVELOPMENT
*** Weekly Summary For Week Of November 3, 1988 ***

Page

[illegible]	[illegible]	E.C.	[illegible]
[illegible]	[illegible]	Dir.	[illegible]
[illegible]	[illegible]	Direction	Southbound
[illegible]	[illegible]	Lanes	[illegible]
Location	RAMP, RTE. 22 E.B. TO RTE. I-495 N.B.		

Time	5 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
[illegible]						42		42
[illegible]						47		47
[illegible]						39		39
[illegible]						11		11
[illegible]						12		12
[illegible]						31		31
[illegible]						104		104
[illegible]						224		224
[illegible]						204		204
[illegible]						183		183
[illegible]						198		198
[illegible]						236		236
[illegible]					214	254		234
[illegible]					634	265		250
[illegible]					272			272
[illegible]					447			447
[illegible]					584			584
[illegible]					717			717
[illegible]					322			322
[illegible]					144			144
[illegible]					111			111
[illegible]					94			94
[illegible]					66			66
[illegible]					92			92
Totals					3297	1850		4664

[illegible] Peak Hr		12:00
[illegible] Count		236
[illegible] Peak Hr	18:00	14:00
[illegible] Count	717	265

AWD : _____

FAD : _____

ADT : _____

COMMONWEALTH OF MASSACHUSETTS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT
*** Weekly Summary for week of November 3, 1988 ***

Data File : M1188052.PRN
Station : 993700
Identification : 127019
City/Town : MARLBOROUGH
Location : RAMP, RTE. I-495 N.B. TO RTE. 20 E.B.

F.C. : ____
INV. : _____
Direction : Combined
Lane(s) : 1

Time	6 Sun	7 Mon	8 Tue	9 Wed	10/ 3 Thu	4 Fri	5 Sat	Wkday Avg.
01:00						42		42
02:00						27		27
03:00						37		37
04:00						4		4
05:00						7		7
06:00						8		8
07:00						30		30
08:00						154		154
09:00						408		408
10:00						514		514
11:00						272		272
12:00						178		178
13:00						232		232
14:00					230	223		227
15:00					174			174
16:00					164			164
17:00					239			239
18:00					333			333
19:00					337			337
20:00					238			238
21:00					154			164
22:00					183			183
23:00					106			106
24:00					86			86
Totals					2194	2135		4104

AM Peak Hr 10:00
AM Count 514

PM Peak Hr 19:00 13:00
PM Count 337 332

AWD : _____

FRD : _____

ADT : _____

Appendix C

Route 20 Right-of-Way and MDPW Roadway Inventory File

ROUTE 20 RIGHT-OF-WAY (ROW)[1] (feet)

Weston

From	To	ROW
Route 128 SB off-Ramp	Sibley Street	75
Sibley Street	Crescent Street	60
Crescent Street	Wellesley Street	70
Wellesley Street	Highland Street	120
Highland Street	Wayland TL	50

Wayland

From	To	ROW
Weston TL	Sudbury River Bridge	50
Sudbury River Bridge	Sudbury TL	65
Sudbury TL	Sudbury Landfill	50

Sudbury

From	To	ROW
Wayland TL	Nobscot Road	50
Nobscot Road	Horse Pond Road	50
Horse Pond Road	Peakham Street	60
Peakham Street	Wayside Inn Road	70-130
Wayside Inn Road	Marlborough TL	100

Marlborough

From	To	ROW
Sudbury TL	Wayside Inn Road	100
Wayside Inn Road	Old Boston Post Road West	60-70
Old Boston Post Road West	Wilson Street	60-80
Wilson Street	Concord Road	60-80
Concord Road	Hosmer Street	50-60
Hosmer Street	Stevens Street	50-60
Stevens Street	Main Street	50
Main Street	Mechanic Street	60-80
Mechanic Street	South Street	60
South Street	Williams Street	50-60
Williams Street	Route I-495	65-70
Route I-495	Ames Street	65-100
Ames Street	Northborough TL	65-80

1. This Table presents the "best estimate" of Right-of-Way from existing plans. The exact ROW will have to be determined at the preliminary design phase of projects.

MDPW ROADWAY INVENTORY FILE
(Segments are shown on following maps)

EST TO EAST
TOWN MARLBOROUGH

SEGMENT CODE	SEGMENT LENGTH	EASTBOUND SIDEWALK	EASTBOUND SHOULDER	# OF LANES	SURFACE WIDTH	WESTBOUND SHOULDER	WESTBOUND SIDEWALK	CURBS	SURFACE TYPE
M1A	0.25	0	0	2	40	2	0	2	11
M1B	1.16	0	0	2	36	2	0	2	11
M1C * $	0.31	5	2	2	36	2	5	5	11
M1	0.24	0	5	2	40	0	4	1	9
M2	0.38	0	5	2	40	10	0	0	9
M3	0.17	6	0	2	50	0	6	3	9
M4 ---	0.52	6	0	2	50	0	6	3	9
M5 ---	0.29	7	0	2	40	0	6	3	11
M6	0.09	4	2	2	35	0	0	2	11
M7	0.34	4	2	2	35	0	0	2	11
M8	0.36	0	2	2	38	0	0	3	11
M9	2.32	0	2	2	38	0	0	3	11
	TOTAL	AVG	AVG		AVG	AVG	AVG		
	6.43	6	5		39.83	2	5.2		
	0.54	2.67			21.34				

* AT I-495 INTERCHANGE
$ IN EACH DIRECTION

SUDBURY

SEGMENT CODE	SEGMENT LENGTH	EASTBOUND SIDEWALK	EASTBOUND SHOULDER	# OF LANES	SURFACE WIDTH	WESTBOUND SHOULDER	WESTBOUND SIDEWALK	CURBS	SURFACE TYPE
S1	0.77	0	2	2	37	2	0	0	11
S2	0.45	0	5	2	31	2	0	1	11
S3	0.19	0	5	2	26	5	5	3	11
S4	0.37	0	3	2	24	3	5	3	11
S5	0.24	0	3	2	24	3	5	1	11
S6	0.69	0	3	2	24	3	0	0	11
S7	0.18	0	3	2	24	3	0	3	11
S8	0.32	0	3	2	24	3	0	1	11
S9	0.47	0	3	2	24	3	6	1	11
S10	0.52	0	3	2	24	3	0	1	11
S11	0.58	0	3	2	24	0	0	1	9
S12	0.22	0	3	2	24	4	0	3	11
S13	0.11	0	0	2	24	0	0	0	11
	TOTAL	AVG	AVG		AVG	AVG	AVG		
	5.11	-	2.769		25.69231	2.615	5.25		

0.393077

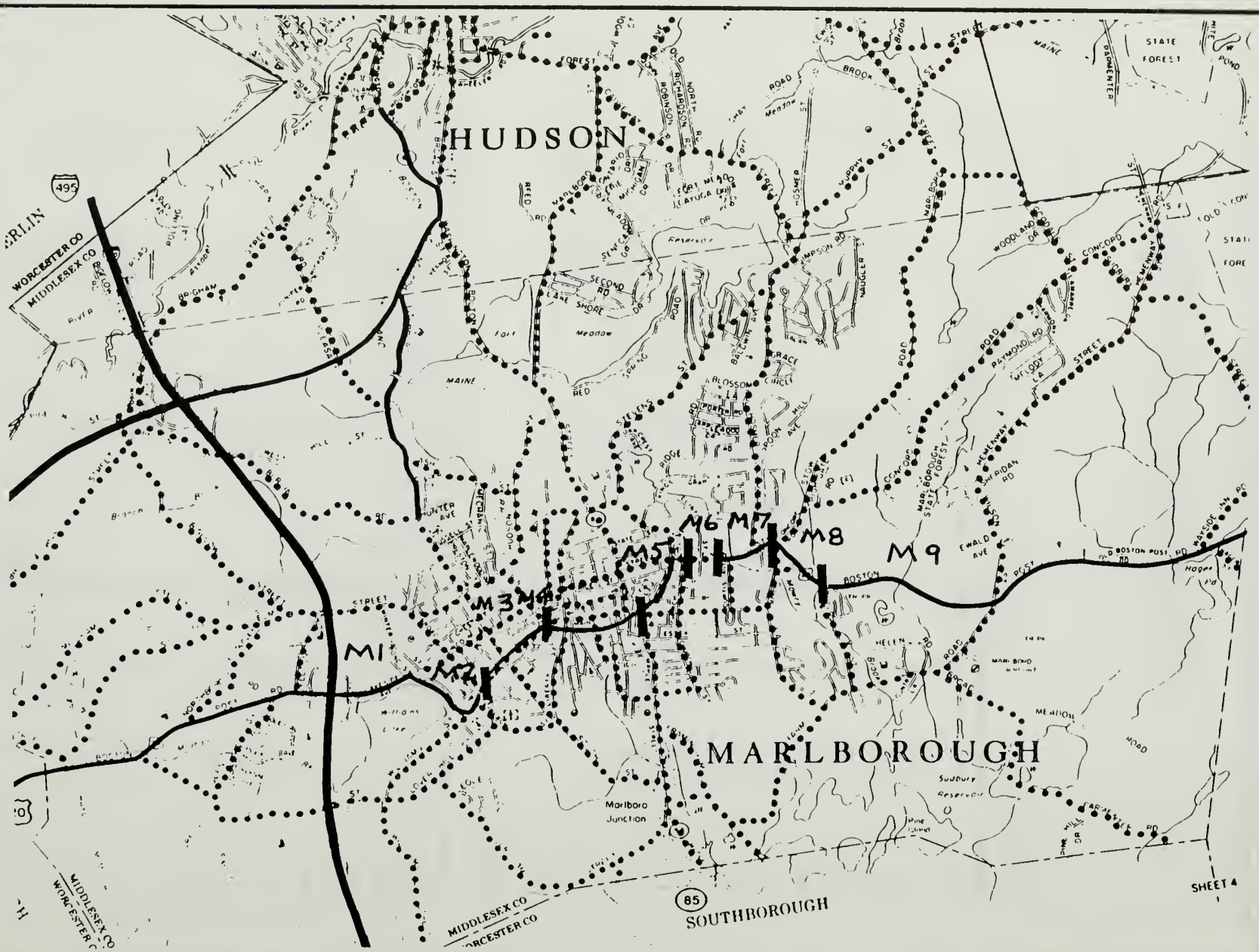
::
WAYLAND

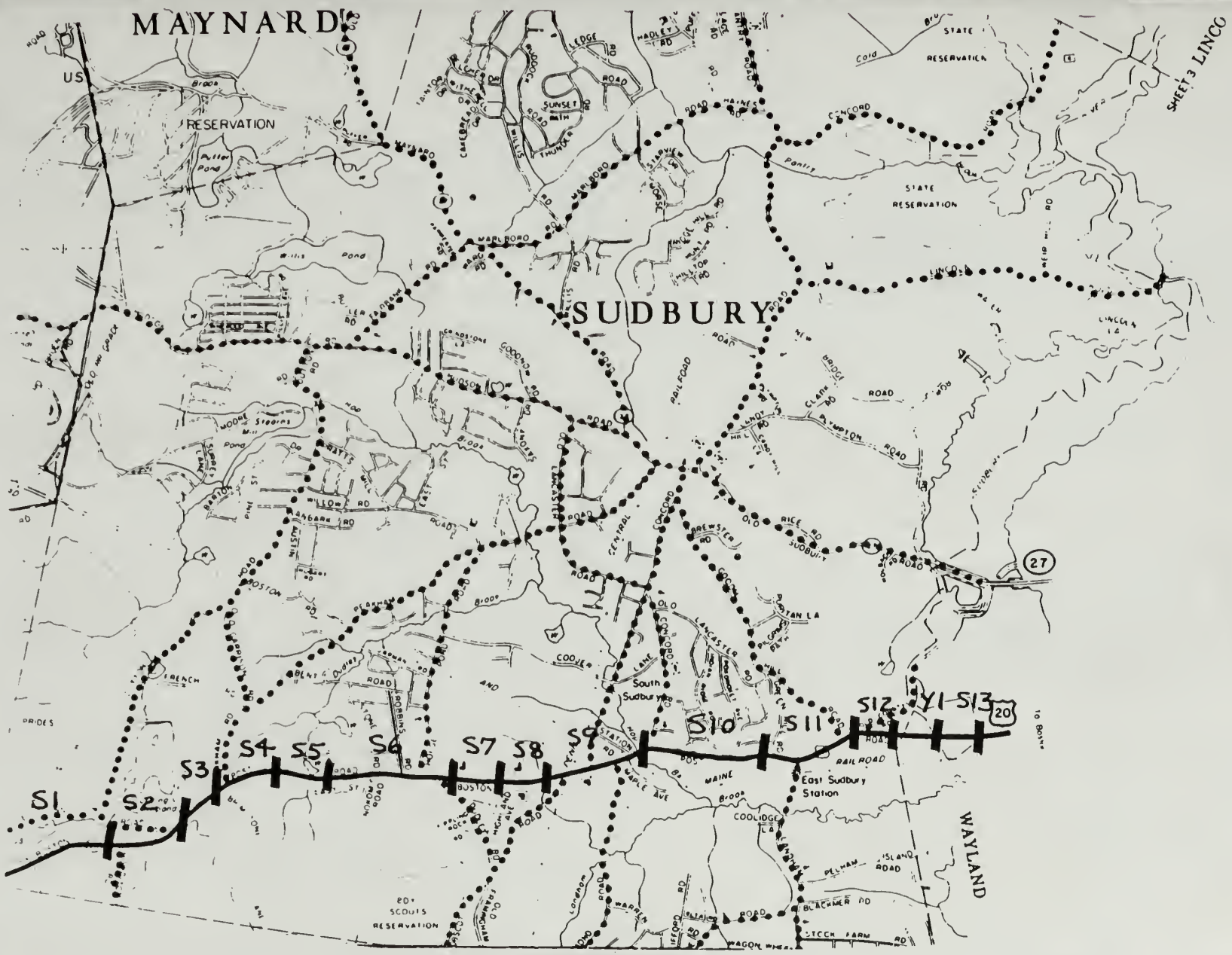
SEGMENT CODE	SEGMENT LENGTH	EASTBOUND SIDEWALK	EASTBOUND SHOULDER	# OF LANES	SURFACE WIDTH	WESTBOUND SHOULDER	WESTBOUND SIDEWALK	CURBS	SURFACE TYPE
Y1	0.18	0	3	2	32	3	0	3	9
Y2	0.16	0	4	2	30	4	0	3	11
Y3	0.71	0	4	2	30	4	0	0	11
Y4	0.08	0	4	2	30	4	0	2	11
Y5	0.17	5	4	2	30	4	0	2	11
Y6	0.37	5	4	2	30	4	0	2	11
Y7	0.1	5	4	2	30	4	0	3	11
Y8	0.32	0	4	2	30	4	0	2	11
Y9	0.23	0	4	2	30	4	0	3	11
Y10	0.43	5	4	2	30	4	0	3	11
Y11	0.09	0	4	2	30	4	0	1	11
Y12	0.09	0	4	2	30	4	5	3	11
	TOTAL	AVG	AVG		AVG	AVG	AVG		
	2.93	5	3.916		30.16667	3.916	5		
	0.244167								

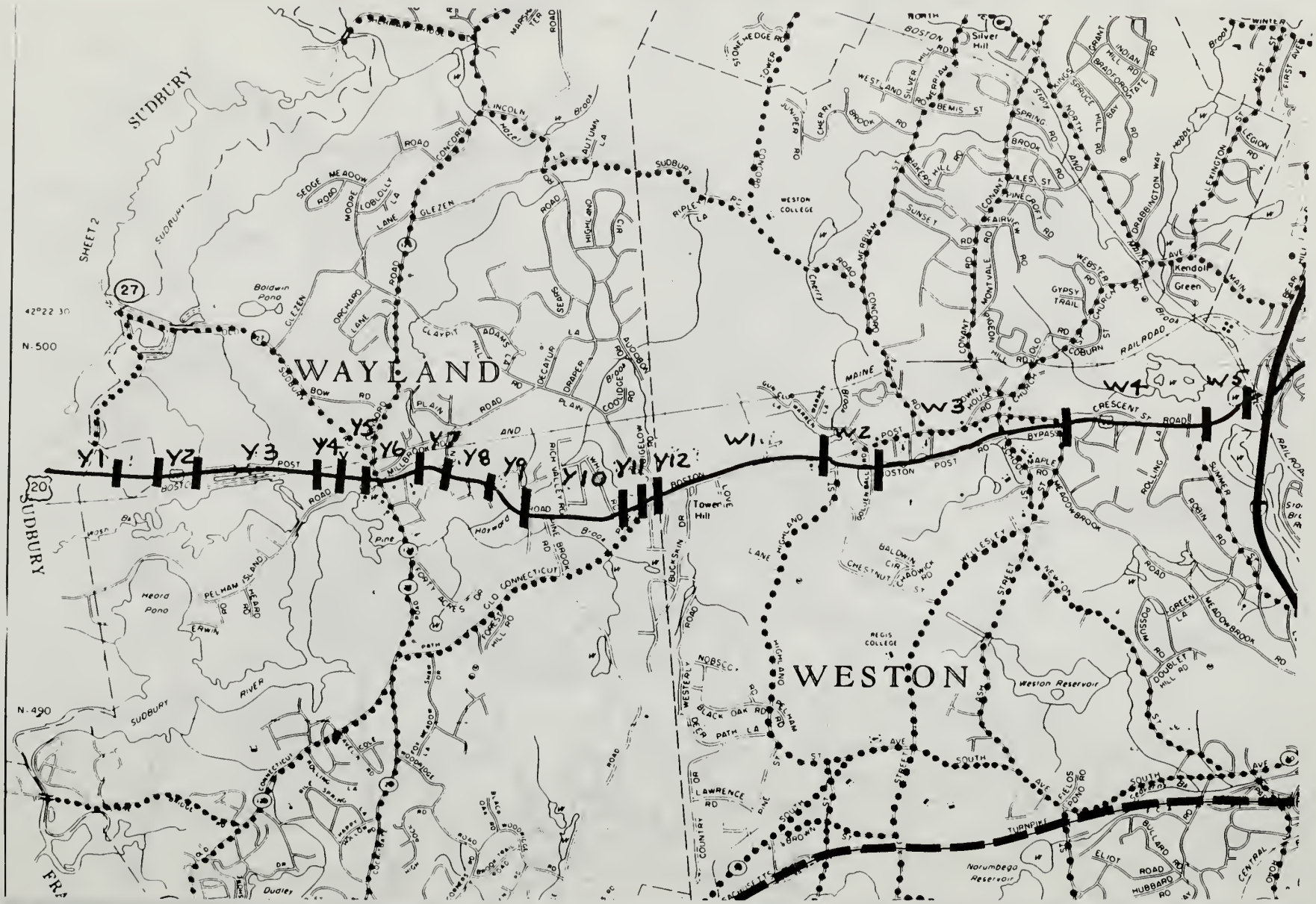
::

WESTON

SEGMENT CODE	SEGMENT LENGTH	EASTBOUND SIDEWALK	EASTBOUND SHOULDER	# OF LANES	SURFACE WIDTH	WESTBOUND SHOULDER	WESTBOUND SIDEWALK	CURBS	SURFACE TYPE
W1	0.99	0	4	2	24	4	5	1	9
W2	0.32	4	2	2	38	2	0	2	9
W3	1.03	0	2	2	38	2	0	0	9
W4	0.76	0	2	2	36	2	6	3	9
W5	0.31	6	2	2	36	2	6	3	9
	TOTAL	AVG	AVG		AVG	AVG	AVG		
	3.41	5	2.4		34.4	2.4	5.66		
	0.682								


HUDSON
MARLBOROUGH
SOUTHBOROUGH
WORCESTER CO
MIDDLESEX CO
MIDDLESEX CO
WORCESTER CO
M1
M2
M3
M4
M5
M6
M7
M8
M9
495
85
Marlboro Junction
SHEET 4


MAYNARD
SUDBURY
WAYLAND
SHEET 3 LINCO
US
RESERVATION
STATE RESERVATION
STATE RESERVATION
SUNSET MTN
CONCORD ROAD
MARLBORO
OLD SUDBURY ROAD
RAILROAD
CLARK ROAD
PLYMPTON ROAD
RICE RD
WILLOW RD
HANSCOM FIELD
South Sudbury
East Sudbury Station
COOLIDGE LA
PELHAM ISLAND ROAD
BLACKMER RD
WAGON WHEEL RD
BOY SCOUTS RESERVATION
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
Y1
S13
27
20


SUDBURY
WAYLAND
WESTON
SHEET 2
42°22 30
N-500
N-490
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y11
Y12
W1
W2
W3
W4
W5
Baldwin Pond
Heard Pond
Silver Hill
Town Hill
Weston Reservoir
Norumbega Reservoir
REGIS COLLEGE
WESTON COLLEGE
Kendall Green
BOSTON POST ROAD
SUDBURY ROAD
CONCORD ROAD
MAIN STREET
CRESCENT ST
TURNPIKE
RAILROAD
RIVER

Appendix D

Historical Information on Bus and Commuter Rail Service

HISTORICAL INFORMATION ON BUS AND COMMUTER RAIL SERVICE

Bus Transportation[1]

Bus service between Boston and Worcester via Route 20 was first established in September 1924 by Boston and Worcester Street Railway Company (B & W). The original routing between Boston and Weston was via Newton but after a few months it was shifted to run Route 20 through Waltham and Watertown. Service was run hourly but started too late in the day for Boston commuters.

In December of 1927, the B & W was sold to a new company, the Boston, Worcester and New York Street Railway Company (B, W & NY ST. RY), which continued the Route 20 service. In 1929 the schedule was expanded to commuting hours. The Route 20 line still had hourly service in March 1963, when the B, W & NY ST. RY was succeeded by the Boston-Worcester Corporation (B & W Lines). In August 1966 the B & W re-routed some trips on the Route 20 line between Weston and Boston via Route 128 and the Massachusetts Turnpike.

In July 1971, the B & W sold all of its routes including the Route 20 service to the Gray Line, Inc.. This company began cutting back service and started looking for a buyer for the Route 20 line in late 1972. In 1973 service was reduced to four round trips a day, and in September of that year it was sold to Ritchie Bus Lines, Inc. of Marlborough. Ritchie ran the route until the early 1980's, but gradually cut back the number of trips.

In 1980, Route 20 service was transferred back to the Gray Line. Service was down to two round trips a day, one starting at Northborough and one at Marlborough. In 1983 this service was taken over by Suburban Lines, and in 1984 it was taken over by King's Transport. This company reduced service to one round trip a day from Northborough to Boston as of November 5, 1984.

Commuter Rail - The Central Massachusetts Branch

Sudbury, Wayland and Weston are located along the right-of-way of the Central Massachusetts Branch of the Boston and Maine Railroad (B & M). Actually, the history of this branch is described, in a very vivid and sentimental way, in the book "The Central Mass." published in 1975 by the Boston & Maine Railroad Historical Society, Inc. which was used by the authors as a reference for this

---

[1]All historical information in this subsection was supplied to the authors by Tom Humphrey of the Transit Operations group at CTPS.

subsection. The map of Figure 1[2] shows, among other rail lines, the 1907 location and present status of the Central Mass. branch.

The Central Massachusetts branch opened on October 1, 1881, 13 years after James Sumner Draper from Wayland and other residents from Sudbury and Weston petitioned to the Massachusetts legislature for the construction of a railroad through their town. The line was constructed initially between Hudson and Boston and offered, daily, four round trips to Boston and four round trips to Waltham. Later, in 1887, the railroad was expanded to Northhampton.

By 1957 the impacts of the automobile were felt everywhere including the Central Mass. branch. Service and round trips were gradually reduced until, in 1965, service was cut to South Sudbury with one round trip to Boston per day. Subsidized by the MBTA, ridership was down to approximately 70 commuters per day. In 1971, funding for the Central Mass. branch was eliminated from the MBTA's annual appreciation for commuter rail subsidy, and July 30, 1971 was announced as the date for the final train run. Wayland residents rallied community support and pressured the MBTA to experiment for a month with four round trips per day starting October 1, 1971 (see Figure 2). Ridership increased but not enough to justify the cost of the re-established service. After a 30 day extension of the experiment, the service was permanently discontinued on November 26, 1971.

Schedules of commuter rail and bus service between 1927 and 1990 can be found following Figure 2. From these samples, one can see the steady reduction in service over time.

---

[2]Courtesy of Tom Humphrey from the Transit Operations group at CTPS

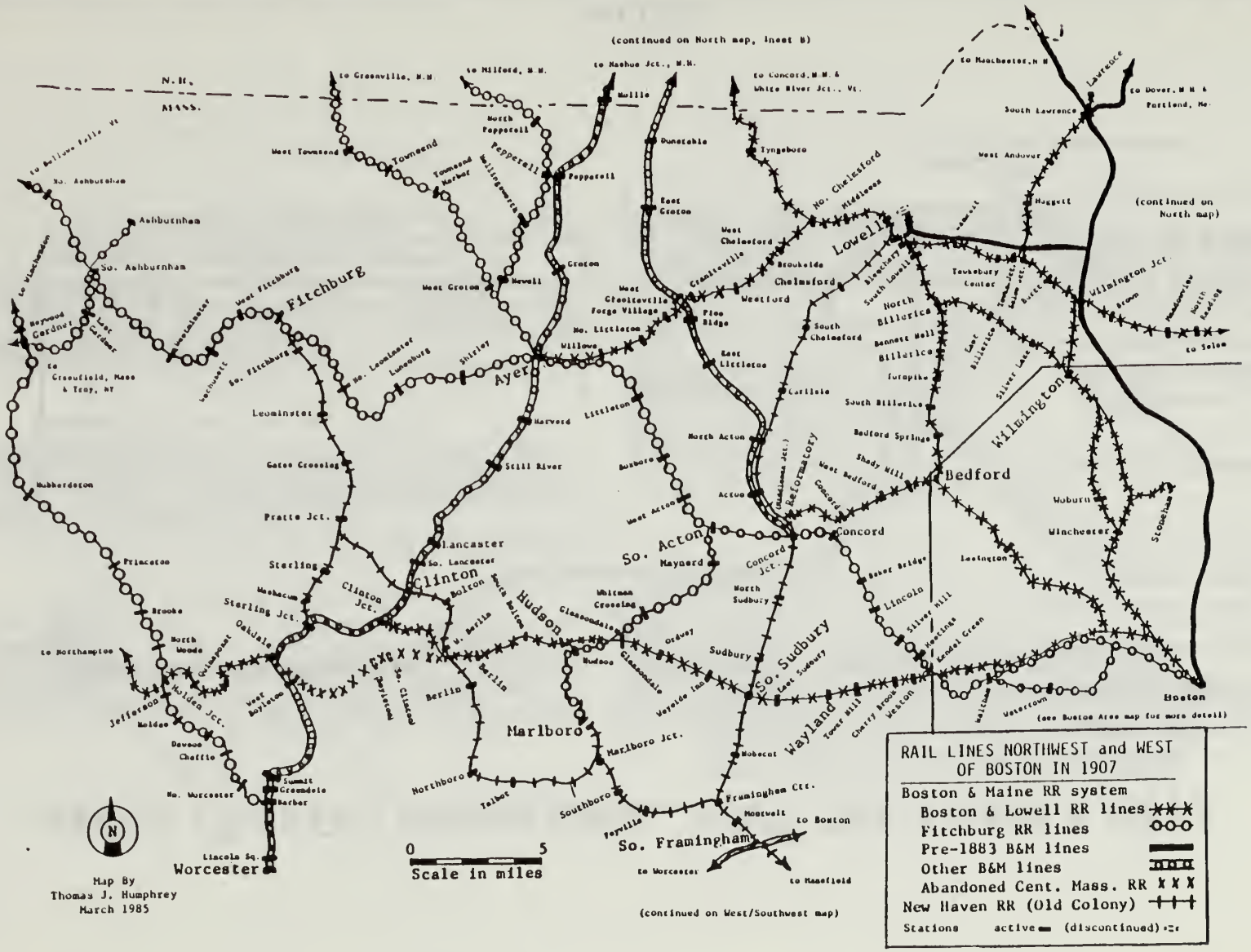
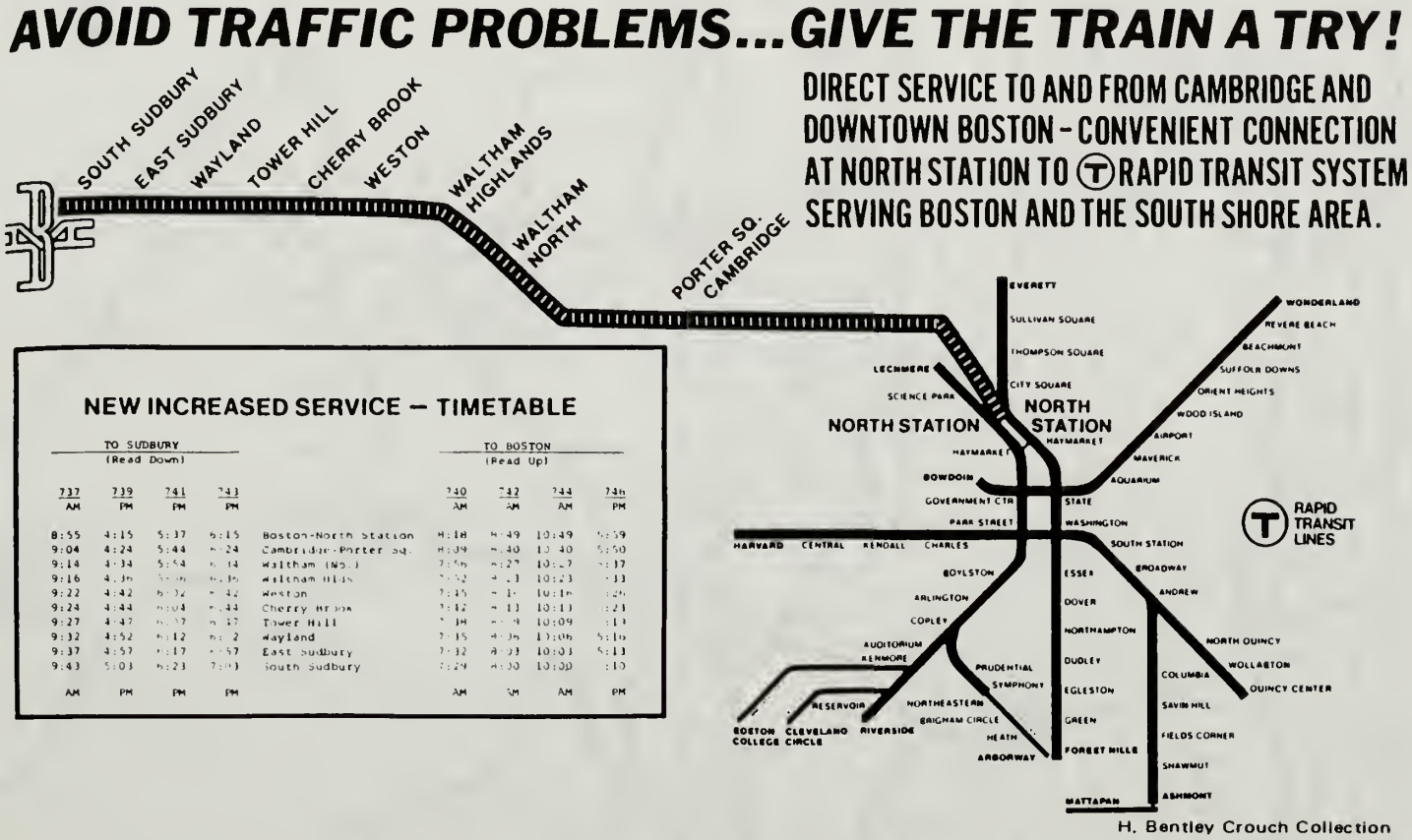

(continued on North map, inset B)
N.H.
MASS.
to Greenville, N.H.
to Milford, N.H.
to Nashua Jct., N.H.
to Concord, N.H. & White River Jct., Vt.
to Manchester, N.H.
to Dover, N.H. & Portland, Me.
Lawrence
South Lawrence
West Andover
Haggett
(continued on North map)
Tyngsboro
Dunstable
Hollis
North Pepperell
Pepperell
West Townsend
Townsend
Townsend Harbor
Willowdale
East Groton
West Groton
Groton
Newell
West Chelmsford
Graniteville
Forge Village
Pine Ridge
Westford
Brookside
Chelmsford
No. Chelmsford
Middlesex
Lowell
Stevens
Tewksbury Center
Wilmington Jct.
Brown
Andover
North Andover
to Salem
North Billerica
Bennett Hall
Billerica
East Billerica
Turnpike
South Billerica
Silver Lake
Wilmington
Bedford Springs
Shady Hill
Bedford
West Bedford
Concord
Concord Jct.
Baker Bridge
Lincoln
Silver Hill
Hastings
Lexington
Woburn
Winchester
Stoneham
Boston
(see Boston Area map for more detail)
Waltham
Watertown
Cherry Brook
Weston
Tower Hill
Wayland
Natick
Framingham Ctr.
Mooreell
to Boston
Hobecat
Fayville
Southboro
Northboro
Talbot
Marlboro Jct.
Marlboro
Berlin
Berlin Jct.
Hudson
Glasscodale
Whitman
Crossing
Ordway
Sudbury
North Sudbury
So. Sudbury
Lost Sudbury
Boylston
Oakdale
Sterling Jct.
Clinton Jct.
Clinton
Bolton
South Bolton
Lancaster
So. Lancaster
Sterling
Wachusett
Princeton
Brooks
North Wood
to Northampton
Jefferson
Holden
Holden Jct.
Dawson
Chaffin
No. Worcester
Summit
Grandale
Barber
Lincoln Sq.
Worcester
Map By
Thomas J. Humphrey
March 1985
0
5
Scale in miles
to Worcester
to Mansfield
So. Framingham
(continued on West/Southwest map)
Ayer
Willow
No. Littleton
East Littleton
Littleton
Harvard
Still River
Bolton
Leominster
No. Leominster
Lunenburg
Shirley
West Fitchburg
So. Fitchburg
Fitchburg
Lochmere
Westminster
Gardner
West Gardner
East Gardner
Heywood
to Greenfield, Mass & Troy, NY
to Winchendon
to Bellows Falls, Vt.
So. Ashburnham
Ashburnham
Hubbardston
Gates Crossing
Pratts Jct.
Carlisle
North Acton
Acton
West Acton
Babson
So. Acton
Maynard
RAIL LINES NORTHWEST and WEST OF BOSTON IN 1907
Boston & Maine RR system
Boston & Lowell RR lines
Fitchburg RR lines
Pre-1883 B&M lines
Other B&M lines
Abandoned Cent. Mass. RR
New Haven RR (Old Colony)
Stations active (discontinued)

FIGURE 1


AVOID TRAFFIC PROBLEMS...GIVE THE TRAIN A TRY!
DIRECT SERVICE TO AND FROM CAMBRIDGE AND DOWNTOWN BOSTON - CONVENIENT CONNECTION AT NORTH STATION TO (T) RAPID TRANSIT SYSTEM SERVING BOSTON AND THE SOUTH SHORE AREA.
SOUTH SUDBURY
EAST SUDBURY
WAYLAND
TOWER HILL
CHERRY BROOK
WESTON
WALTHAM HIGHLANDS
WALTHAM NORTH
PORTER SQ. CAMBRIDGE
NEW INCREASED SERVICE — TIMETABLE
TO SUDBURY (Read Down)
TO BOSTON (Read Up)
737 AM | 739 PM | 741 PM | 743 PM | 740 AM | 742 AM | 744 AM | 74n PM
8:55 | 4:15 | 5:37 | 6:15 | Boston-North Station | 8:18 | 8:49 | 10:49 | 5:59
9:04 | 4:24 | 5:44 | 6:24 | Cambridge-Porter Sq. | 8:09 | 8:40 | 10:40 | 5:50
9:14 | 4:34 | 5:54 | 6:34 | Waltham (No.) | 7:59 | 8:29 | 10:29 | 5:37
9:16 | 4:36 | 5:56 | 6:36 | Waltham Hills | 7:57 | 8:27 | 10:23 | 5:33
9:22 | 4:42 | 6:02 | 6:42 | Weston | 7:51 | 8:21 | 10:15 | 5:25
9:24 | 4:44 | 6:04 | 6:44 | Cherry Brook | 7:49 | 8:19 | 10:13 | 5:23
9:27 | 4:47 | 6:07 | 6:47 | Tower Hill | 7:46 | 8:16 | 10:09 | 5:19
9:32 | 4:52 | 6:12 | 6:52 | Wayland | 7:41 | 8:11 | 10:04 | 5:14
9:37 | 4:57 | 6:17 | 6:57 | East Sudbury | 7:36 | 8:06 | 10:01 | 5:13
9:43 | 5:03 | 6:23 | 7:03 | South Sudbury | 7:29 | 8:00 | 10:00 | 5:10
AM | PM | PM | PM | | AM | AM | AM | PM
EVERETT
SULLIVAN SQUARE
THOMPSON SQUARE
CITY SQUARE
LECHMERE
SCIENCE PARK
NORTH STATION
NORTH STATION
HAYMARKET
HAYMARKET
BOWDOIN
GOVERNMENT CTR
PARK STREET
STATE
WASHINGTON
HARVARD
CENTRAL
KENDALL
CHARLES
SOUTH STATION
BOYLSTON
ARLINGTON
COPLEY
AUDITORIUM
KENMORE
PRUDENTIAL
SYMPHONY
RESERVOIR
NORTHEASTERN
BRIGHAM CIRCLE
HEATH
ARBORWAY
BOSTON COLLEGE
CLEVELAND CIRCLE
RIVERSIDE
ESSEX
DOVER
NORTHAMPTON
DUDLEY
EGLESTON
GREEN
FORREST HILLS
MATTAPAN
BROADWAY
ANDREW
NORTH QUINCY
WOLLASTON
QUINCY CENTER
COLUMBIA
SAVIN HILL
FIELDS CORNER
SHAWMUT
ASHMONT
WONDERLAND
REVERE BEACH
BEACHMONT
SUFFOLK DOWNS
ORIENT HEIGHTS
WOOD ISLAND
AIRPORT
MAVERICK
AQUARIUM
(T) RAPID TRANSIT LINES

H. Bentley Crouch Collection

FIGURE 2

SAXONVILLE BUS LINE

FRAMINGHAM TO SAXONVILLE—Week Days

STATIONS	A.M.	A.M.	A.M.	A.M.	A.M.		P.M.		P.M.	P.M.	P.M.	P.M.		P.M.
Framingham	6.00	6.15	6.45	7.30	8.30	Hourly until	2.30	Half Hourly until	4.30	Every 30 minutes until	5.40	6.08	6.20	Hourly until	11.20
Framingham Jct.	6.07	6.22	6.52	7.37	8.38		2.38		4.38		5.47	6.15	6.28		11.28
Saxonville	6.17	6.32	7.02	7.47	8.40		2.40		4.40		6.00	6.25	6.40		11.40
	A.M.	A.M.	A.M.	A.M.	A.M.		P.M.		P.M.		P.M.	P.M.	P.M.		P.M.

Sundays and Holidays—Lv Framingham for Saxonville hourly 7.30 a.m. to 11.30 p.m.
Saturday afternoons and evenings—Half hour time and extra service.

SAXONVILLE TO FRAMINGHAM—Week Days

STATIONS	A.M.	A.M.	A.M.	A.M.	A.M.		P.M.		P.M.	P.M.	P.M.		P.M.		P.M.
Saxonville	6.17	6.55	7.10	7.50	8.45	Hourly until	2.45	Half Hourly until	4.45	5.08	5.16	Half Hourly until	7.45	Hourly until	11.45
Framingham Jct	6.25	6.43	7.20	7.58	8.54		2.54		4.54	5.17	5.24		7.54		11.54
Framingham	6.35	6.50	7.30	8.06	9.02		3.02		5.02	5.32	5.32		8.02		12.02
	A.M.	A.M.	A.M.	A.M.	A.M.		P.M.		P.M.	P.M.	P.M.		P.M.		A.M.

Sundays and Holidays—Lv Saxonville for Framingham hourly 7.45 a.m. to 11.45 p.m.
Saturday afternoons and evenings—Half hour time and extra service

UNION AVENUE BUS LINE

FRAMINGHAM TO FRAMINGHAM CENTRE

WEEK-DAYS—Buses leave Framingham for Framingham Centre half hourly 6.15 a.m. to 12.15 a.m. Additional 15-minute service 4.45 p.m. to 6.15 p.m. except Saturday.

SUNDAYS and HOLIDAYS—Leave Framingham for Framingham Centre half hourly 7.45 a.m. to 12.15 a.m.

FRAMINGHAM CENTRE TO FRAMINGHAM

WEEK-DAYS—Buses leave Framingham Centre for Framingham 5.45 a.m., 6.00 p.m., half hourly until 11.30 p.m. Additional 15-minute service 6.30 p.m. to 6.00 p.m. except Saturday.

SUNDAYS and HOLIDAYS—Leave Framingham Centre for Framingham half hourly 7.30 a.m. to 11.30 p.m.

MOTOR COACH SERVICE

BOSTON-MARLBORO-WORCESTER

BOSTON TO MARLBORO AND WORCESTER

		Daily		
		A.M.	P.M.	P.M.
Boston	Lv	8.30	3.30	11.15
Walnut St.	Lv	8.55	3.55	11.40
Waltham	Lv	9.05	4.00	11.45
Weston		9.10	4.10	11.55
Wayland		9.20	4.20	12.05
So. Sudbury		9.25	4.25	12.10
Marlboro	Ar	9.45	4.45	12.30
Northboro	Ar	10.00	5.00	12.45
Shrewsbury	Ar	10.15	5.15	1.00
Worcester	Ar	10.30	5.30	1.15
		A.M.	P.M.	A.M.

Hourly until

MARLBORO AND WORCESTER TO BOSTON

		Daily		
		A.M.	P.M.	
Worcester	Lv	9.00	10.00	
Shrewsbury	Lv	9.15	10.15	
Northboro	Lv	9.30	10.30	
Marlboro	Lv	9.45	10.45	
So. Sudbury		9.50	10.50	
Wayland		9.55	10.55	
Weston		10.05	11.05	
Waltham	Ar	10.15	11.15	
Watertown	Ar	10.25	11.25	
Boston	Ar	10.40	11.40	
		A.M.	A.M.	

Hourly until

181209 15M 7-1-'27

BOSTON & WORCESTER STREET RAILWAY CO.

FRANKLIN T. MILLER, Receiver

SUMMER TIMETABLE

EFFECTIVE JULY 11, 1927

Electric Cars-Motor Coaches

GENERAL OFFICES
FRAMINGHAM, MASS. Tel. Framingham 230

BOSTON TERMINAL Ticket Office and Waiting Room
12 Park Square Tel. Hancock 9423

WORCESTER TERMINAL Ticket Office and Waiting Room
Salem Square Tel. Park 6601

This timetable shows the time at which cars or motor coaches may be expected to arrive and depart from the several points along the line, and is subject to change without notice. This company does not hold itself responsible for any delays or consequences arising therefrom.

HOTEL MINERVA

214 HUNTINGTON AVE. - BOSTON, MASS.
(Opposite Christian Science Church)

Rates—One Person $2.50 to $3.00
Two Persons $4.00, $5.00

CAFE MINERVA and CAFETERIA

Under the Same Management
HARRY C. DEMETER

Established 1003
TEL. KENMORE 7613

BOSTON–(LAWRENCE)–MANCHESTER

Eastern Standard Time

Daily, except as indicated		WD							8&Su			8O						8O
Boston	Lv.			8.45				12.42			2.12	4.15						
Stoneham	Lv.			9.15				1.18			2.45	4.43						
South Lawrence	Ar.			9.50				2.00			3.30	5.30						
South Lawrence R.R. Sta.	Lv.	5 20		10 00				2.05			3.35	2.35				* 8.35		
Lawrence Railroad Station	Lv.	5.25		10 05				2.10			3.40	2.40				* 8.40		
Methuen Square	Lv.	0.35		10 15				2.20			3.50	2.50				* 8.50		
Salem Square	Lv.	8.45		10.25				2.30			4.00	8.00				*10.00		
Derry (Family Drug Store)	Lv	7.10		10.50	11 05		12.08	2 55	4 05	4.25	8 25	17.05	8.03		*10.25		11.33	
Wilson (Railroad Station)	Lv.	7 21		11 04	11 10		12.19	3.09	4.10	4.30	8.39	17.10	8 19		*10.39		12 00	
Londonderry (R.R. Sta.)	Lv.	7 20		11 09	11.24		12.24	3.14	4.24	4.44	8 44	17.24	8.24		*10.44		12 11	
Harvey Road	Lv.	7 38		11.18	11.33		12.33	3.23	4.33	4 23	8.53	17.33	8.33		*10.53		12.2	
Manchester	Ar.	7 53		11.33	11 48		12.48	3.35	4.48	3.03	7.03	17.45	5.48		*11.05		12.35	

		WD		S&Su			8uO	WD				Su&H		8O		
Manchester	Lv.	4 40	5.40	10 03	12.20	3.05	3.20	4.00	5.05	18.05	*6.30	8.00	8..0	11 15		
Harvey Road	Lv	4 53	5 55	10.20	12.35	3.20	3.33	4.15	5 20	18.20	*6.45	8.12	8.43	11.30		
Londonderry (Rlt.Sta.)	Lv.	5 04	7.04	10 29	12.44	3.29	3.44	4 24	5.29	12.20	*2 54	8.24	8.54	11.3y		
Wilson R. R. Station	Lv	5 08	7.09	10 34	12.40	3.34	3.49	4 29	9.34	18.34	*8.59	8.20	8.59	11.4i		
Derry (F D S)	Ar.	5 22	7 20	10 48	1.00	3.42	4 00	4.40	5.48	18.43	*7.10	2 40	10.13	11.33		
Salem Square	Ar.	5 47	7.45		1.25		4.23	5.05			*7.35	2.05				
Methuen Square	Ar.	5 57	7.35		1.35		4.35	5.15			*7.48	2.12				
Lawrence R. R. Sta.	Ar.	9 07	8 03		1.45		4.45	3.25			*7.58	8.25				
So. Lawrence Rlt.Sta.	Ar.	8 12	8.10		1.50		4.50	5.30			*8 00	2.30				
So. Lawrence Rlt.Sta	Lv		8 12		1.52			5.32				9.35				
Stoneham	Lv.		8.55		2.35			6.13				10.20				
Boston	Ar.		9.25		3.03			6.45				10.50				

WD—Week-days. 8O—Saturdays only. SuO—Sundays only. S&Su—Saturdays and Sundays. Su&H—Sundays and Holidays. †Will not run Saturdays, Sundays or Holidays. *Runs Saturdays, Sundays and Holidays only. Only interstate passengers handled, except between Manchester and Derry. Manchester-South Lawrence 29.5 miles. Manchester-Boston 57 miles.

BOSTON & MAINE TRANSPORTATION COMPANY

BOSTON–NEWPORT

Daylight Saving Time

Boston	0 15	1.13	5 30	*10 00	Newport	0 00	2.00	8.00	*7.00
Stoughton	10 00	2 00	8.13	*10.43	Tiverton	9 30	2.30	6.30	*7.30
Taunton	10 30	2.30	8.45	*11.15	Taunton	10 15	3.15	7.13	*8 16
Tiverton	11 15	3.15	7.30	*12.00	Stoughton	10 45	3.45	7.45	*8 42
Newport	12 00	4.00	8.13	*12 45	Boston	11 45	4.45	8.45	*8.43

*Sundays only.

Fare: Boston-Newport $2 23. Boston-Fall River $1.75 (effective in either direction).

Time, Boston-Newport, 2 hours 45 minutes.

TERMINALS—Newport, Short Line Waiting Room, 24 Washington Square. Phone 122: Boston, 3 Providence Street (Park Square). Phone Kenmore 1025; Fall River, Union Coach Terminal, Pocasset Street. Phone 7050.

NEWPORT AND PROVIDENCE RAILWAY COMPANY

Boston-Portland

Daylight Saving Time

Leave Boston (Hotel Lenox)—Daily: 8.30 A.M.: 12.15, 2.00 P.M.
Leave Old Orchard (Sears & Hinchliffe, the Rexall Store)—Daily: 8.55 A.M.; 2.25, 6.10 P.M.
Leave Portland (Hotel Lafayette)—Daily: 8.30 A.M.; 2.00, 5.45 P.M.
Leave Biddeford (Hotel Thacher)—Daily: 9.05 A.M.; 2.35, 6.20 P.M.
Phones: Boston, Kenmore 5577 and Arlington 2551; Portland, Forest 548 and 7870. Fares: one way $3.50, round trip $4.50. "Be sure it's a Queen Line coach!"

NEW ENGLAND MOTOR TOURS

BOSTON-WORCESTER

SEPT. 1928

Daylight Saving Time

		DAILY							DAILY			
Boston	Lv	5 30		0 30	11.15		Worcester	Lv.	8 00		10 00	
Watertown	Lv.	5 53		9 53	11 40		Shrewsbury	Lv.	5 13		10 13	
Waltham	Lv.	0 00		10 00	11.48		Northboro	Lv.	5 23		10 25	
Weston		2 10	Hourly Until	10 10	11 53	Hourly Until	Marlboro	Lv.	8 45	Hourly Until	10 45	Hourly Until
Wayland		0 20		10 20	12 05		South Sudbury		0 05		11.03	
South Sudbury		0 25		10 25	12 10		Wayland		0 10		11.10	
Marlboro	Ar.	0 45		10 43	12 30		Weston		0.20		11.20	
Northboro	Ar	10 00		11 00	12 43		Waltham	Ar.	0.30		11.30	
Shrewsbury	Ar.	10 15		11.13	1 00		Watertown	Ar.	0.43		11.40	
Worcester	Ar	10 30		11.30	1.15		Boston	Ar.	10.00		12.00	

Fare, Boston-Worcester, $1.25; round trip $2.00. Boston Terminal, 12 Park Square

BOSTON, WORCESTER AND NEW YORK STREET RAILWAY COMPANY

Boston-Greenfield-Albany

Daylight Saving Time

Route is over the beautiful Mohawk Trail via Lexington, Concord and Williamstown

	Daily including Sundays			Daily including Sundays
Boston	Lv.	2 30	Albany, N. Y.	Lv.	8.30
Fitchburg		10 45	Troy, N. Y.		0 00
Rindge, N. H.		11 30	Williamstown		10 45
Winchendon		11 50	North Adams		11 00
Baldwinsville		12 03	Florida		11.45
Athol		12 30	Charlemont		12.15
Orange		12 45	Shelburne Falls		12.38
Erving		12.53	Greenfield	Ar.	1.00
Millers Falls		1.10	Greenfield	Lv.	2.00
Turners Falls		1.20	Turners Falls		2.10
Greenfield	Ar.	1.30	Millers Falls		2 20
Greenfield	Lv	2.30	Erving		2.35
Shelburne Falls		2.53	Orange		2.43
Charlemont		3.15	Athol		3.00
Florida		4.00	Baldwinsville		3.25
North Adams		4.45	Winchendon		3.40
Williamstown		5 00	Rindge, N. H.		4.00
Troy, N. Y.		5 43	Fitchburg		5.00
Albany, N. Y.	Ar	7.00	Boston	Ar.	7.00

Terminals—Boston, 12 Park Square (Hancock 00751; Albany, Hotel Wellington (Main 1000)

HART MOTORCOACH COMPANY

BOSTON–WHITE MOUNTAINS

Eastern Standard Time

Leave Boston (3 Providence Street) Mondays, Wednesdays and Saturdays via Portsmouth, Chocorua, North Conway, Crawford House, Bretton Woods—7.45 A.M.
Sundays, Tuesdays, Thursdays, Fridays via Lowell, Manchester, Franklin, North Woodstock, Bretton Woods, Bethlehem—7.45 A.M.
Leave Bethlehem Mondays, Wednesdays, Saturdays via Twin Mountain, Bretton Woods, North Conway, Chocorua, Portsmouth—9.00 A.M.
Sundays, Tuesdays, Thursdays, Fridays via Bretton Woods, North Woodstock, Franklin, Manchester, Lowell—9.00 A.M.
Time, 10 hours 15 minutes. Fare, $7.80.

BOSTON & MAINE TRANSPORTATION COMPANY

THE ELKS

275 TREMONT STREET (Opposite Hollis Street)

One of Boston's Newest and Most Beautiful Hotels

OPEN TO THE GENERAL PUBLIC

350 Rooms, Baths, Showers and Servidor

Every Known Convenience for the Comfort of Guests

ROOF-GARDEN RESTAURANT

on the 15th Floor—JOE RINES' famous Broadcasting Orchestra

Spanish Room Cafeteria

(Lower Level) Open Daily 7 A. M. to Midnight

In the Heart of the Theatrical and Shopping District
Five Minutes from All Motor Coach Terminals

Tel. HANcock 1400 KIERAN J. LOWRY, *Manager*

BOSTON–NEW YORK

New England Transportation Company

Daily Service					Daily Service				
Boston 247 Tremont Park Square Terminal 18 Columbus Ave.	Lv.	8 50	11.45	8.50	New York W. 34th at 5th Ave.	Lv.	0 00	12 00	10 00
Providence	Due	*10 55	*1.55	*11.52	Darien	Due	*11.10	*2.08	*12.00
Providence	Lv.	11 05	2.00	12 05	Darien	Lv.	11 15	2.10	12 05
Westerly	Lv.	12.43		1 35	Bridgeport	Lv.	12.05	3.00	12 55
New London	Due	† 1.30	Via Hartford	† 2 15	New Haven	Due	†12 48	3.40	* 1 25
New London	Lv.	2.00		2 25	New Haven	Lv.	1.15	3.40	1.45
Saybrook	Lv.	2.47		3.10					
Willimantic	Lv.		3 03		Hartford	Due	Shore Line	18.00	Shore Line
Hartford	Due	Shore Line	18.00	Shore Line	Hartford	Lv.		6.20	
Hartford	Lv.		5.30		Willimantic	Lv.		8.30	
New Haven	Due	4.00	7.00	4 15	Saybrook	Lv.	2.28		2 53
New Haven	Lv	4.00	7.00	4 15	New London	Due	* 3.10	Via Hartford	* 3 30
Bridgeport	Due	4.48	7.40	5 00	New London	Lv.	3.20		3.30
Stamford	Due	5 30	8 40	5 35	Westerly	Due	4.05		4 18
New York	Due	6.00	10.40	6 00	Providence	Due	* 5.50	* 8.30	* 5 50
					Providence	Lv	6 00	8.35	6.00
					Boston	Due	9.00	10.30	9.00

*Rest Stop. †Meal Stop. Fare, Boston-New York, $4.00 (day trip or night trip). Terminals—Boston: Park Square Coach Terminal, 18 Columbus Avenue (Motor Mart Garage); Hubbard 3900. New York: Waldorf-Astoria Coach Terminal, West 34th Street, at 5th Ave.

NEW ENGLAND TRANSPORTATION COMPANY

HOTEL MINERVA

214 HUNTINGTON AVE. - BOSTON, MASS.

(Opposite Christian Science Church)

Rates—One Person $2.50 to $3.00
Two Persons $4.00, $5.00

CAFE MINERVA and CAFETERIA

Under the Same Management
HARRY C. DEMETER

Established 1005
TEL. KENMORE 7515

BOSTON–PORTLAND

Leave Boston (Hotel Lenox)—1.00 P.M. Saturdays: 2.00, 6.45 P.M.
Leave Portland (Hotel Lafayette)—1.00 P.M. Saturdays: 2.00, 6.45 P.M.

THE NEW ENGLAND MOTOR TOURS COMPANY

BOSTON–PROVIDENCE*

New England Transportation Company

Boston Lv	†7 00	Hourly Until	8 00	$10 00	11.18	Providence . Lv.	†7 50	Hourly Until	9.30	$10.15	11.19
Dedham	†7 33		8 33	$10 33	11.45	Pawtucket	†7 44		9 44	$10.29	11.28
Norwood	†7 44		8.44	$18 44	11 32	South Attleboro	†7 55		9 55	$10 40	11.40
East Walpole‡			8 58		12 b5	North Attleboro	†8 05		10.05	$10.51	11.51
Walpole	†7.56		8 58	$10 58	12 11	Plainville	†8 10		10.10	$10.55	11.33
Wrentham	†8 15		10 13	$11.13	12 25	Wrentham	†8 25		10.23	$11.08	12 05
Plainville	†8 25		10 25	$11.23	12 40	Walpole	†8.40		10.40	$11.25	12 25
North Attleboro	†8 29		10 28	$11 28	12 44	East Walpole§					
South Attleboro	†8 55		10 38	$11.38	12 53	Norwood	†8 51		10.51	$11.36	12 35
Pawtucket	†8 50		10 50	$11.30	1 05	Dedham	†10.05		11.03	$11.49	12 49
Providence Due	†10 05		11.03	$12 05	1.20	Boston .... Due	†8.40		11.40	$12.25	1 25

Express Coach Lv. Providence (Fox Point Wharf only) 7.15 A.M.; Due Boston 9.40 A.M
Prov. Line Bus Lv. Boston 5.00 P.M.; Due Providence (Fox Point Wharf only) 7.15 P.M.

†Except Sunday. ‡Sundays and Holidays only. ‡Leave East Walpole for Providence: 7 56. †Except Sunday. §Sundays and Holidays only. (Leave East Walpole for Providence: 8.50, 10 50 A.M.; 2 50, 3 50, 6 50, 9.50 P.M.; 12.03 A.M. Leave East Walpole for Boston: 8.45, A.M., arrives Boston 9 40 A.M. No passengers carried locally Boston-Norwood, Dedham-East Walpole, Plainville-Providence, or points intermediate thereto. Green flag indicates full coach, second or third coach immediately following. Boston-Providence 45 miles; fare $1.25, round trip $2.00.

NEW ENGLAND TRANSPORTATION COMPANY

BOSTON-WORCESTER

		DAILY					DAILY		
Boston	Lv	8 30	Hourly Until	9.30	10 30	11 30	12 00	Worcester Lv.	7 00	Hourly Until	10 00
Watertown	Lv.	8 55		9.55	10.55	11.55	12 25	Shrewsbury Lv.	7 15		10 13
Waltham	Lv.	9 00		10 00	11 00	12.00	12 30	Northboro Lv	7 25		10 25
Weston		9 10		10.10	11.10	12 10	12 40	Marlboro Lv.	5 45 7 45		10 45
Wayland		9 20		10 20	11 20	12 20	12 50	South Sudbury	7 03 8 03		11 03
South Sudbury		9 25		10 25	11.25	12 25	1.00	Wayland	7 10 5 10		11 10
Marlboro Ar		9 45		10 43	11.45	12 45	1.15	Weston	7 20 8 20		11 20
Northboro Ar		10.00		11.00		1 00		Waltham Ar	7 30 5 50		11.30
Shrewsbury Ar.		10.15		11.15		1 15		Watertown Ar.	7 45 8.45		11.45
Worcester Ar.		10.30		11.30		1.30		Boston Ar.	5.00 0.00		12.00

Leave Boston at Park Square; leave Worcester at Salem Square.

BOSTON, WORCESTER AND NEW YORK STREET RAILWAY COMPANY

February 1929

DECEMBER 17, 1934

B, W & NY ST. RY CO.

SPECIAL COACHES FOR PRIVATE

STATION TO STATION PACKAGE SERVICE BETWEEN

ROUTE NO. 1

BOSTON to WORCESTER—Via WAYSIDE INN

Stations	A.M.	A.M.	A.M.		P.M.	P.M.	P.M.	P.M.	MID.	
BOSTON	....	7.00	8.00		8.00	9.00	10.00	11.30	s12.00	
Watertown	....	7.20	8.20		8.20	9.20	10.20	11.50	....	
Waltham	....	7.27	8.27		8.27	9.27	10.25	11.55	....	Via Turnpike
Weston	....	7.35	8.35	EVERY	8.35	9.35	10.30	12.00	....	
Wayland	....	7.48	8.48		8.43	9.43	10.38	12.05	....	
South Sudbury	....	7.49	8.49		8.49	9.49	10.40	12.10	....	
Wayside Inn	....	7.55	8.55	HOUR	8.55	9.55	10.50	12.15	....	
MARLBORO	....	8.05	9.05		9.05	10.05	11.00	12.25	s1.00	
Northboro	....	8.12	9.12		9.12	10.12	s11.10	12.35	....	
Shrewsbury	....	8.20	9.20		9.20	10.20	s11.20	12.40	....	
Fairlawn	....	8.30	9.30		9.30	10.30	s11.30	12.50	....	
WORCESTER	....	8.40	9.40		9.40	10.40	s11.40	1.00	....	

s—Runs Saturdays, Sundays, Holidays only.

Coach from Worcester to Springfield at 15 min. past the odd hours, via Worcester St. Ry. 7.15 a.m. to 9.15 p.m.

Coaches from Worcester to Springfield on the even hours via The Short Line 8.00 a.m. to 10.00 p.m.

WORCESTER to BOSTON—Via WAYSIDE INN

Stations	A.M.	A.M.	A.M.	A.M.		P.M.	P.M.	P.M.
WORCESTER	....	7.00	8.00	9.00		9.00	s10.00	11.00
Fairlawn	....	7.15	8.15	9.15		9.15	s10.15	11.15
Shrewsbury	....	7.20	8.20	9.20		9.20	s10.20	11.20
Northboro	....	7.30	8.30	9.30	EVERY	9.30	s10.30	11.30
MARLBORO	6.45	7.45	8.45	9.45		9.45	s10.45	11.45
Wayside Inn		7.50	8.50	9.50		9.50	s10.50	11.50
South Sudbury		7.55	8.55	9.55	HOUR	9.55	s10.55	11.55
Wayland		8.00	9.00	10.00		10.00	s11.00	12.00
Weston		8.10	9.10	10.10		10.10	s11.10	12.10
Waltham		8.18	9.18	10.18		10.18	s11.18	12.18
Watertown		8.25	9.25	10.25		10.25	s11.25	12.25
BOSTON	8.00	8.45	9.45	10.45		10.45	s11.45	12.45

Via Turnpike

s—Runs Saturdays, Sundays, Holidays only.

Coaches from Springfield to Worcester via The Short Line on the odd hours 7.00 a.m. to 9.00 p.m.

Coaches from Springfield to Worcester via Worcester St. Ry. on the even hours 8.00 a.m. to 8.00 p.m.

ROUTE NO. 2

BOSTON to WORCESTER—Via TURNPIKE

Stations	A.M.	A.M.	A.M.	A.M.		P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	Mid.
BOSTON	....	....	....	7.80		6.30	7.30	9.30	9.30	10.30	11.00	12.00
Brookline	....	....	....	7.43		6.43	7.43	8.43	9.43	10.43	11.13	12.18
Chestnut Hill	....	....	*8.50	7.50	EVERY	6.50	7.50	8.50	9.50	10.50	11.20	12.20
Newton Hds.	....	....	*6.58	7.58		9.58	7.58	9.58	9.58	10.58	11.28	12.28
Upper Falls	....	....	*7.00	8.00		7.00	8.00	9.00	10.00	11.00	11.30	12.80
Well. Hills.	....	....	*7.05	8.05	HOUR	7.06	8.06	9.06	10.05	11.06	11.35	12.35
Well. Falls.	....	....	*7.08	8.08		7.08	8.08	9.08	10.08	11.08	11.38	12.38
Overbrook	....	....	*7.10	8.10		7.10	8.10	9.10	10.10	11.10	11.40	12.40
No. Natick	....	....	*7.15	8.15		7.15	8.16	9.16	10.15	11.15	11.45	12.45
Fram. Jct.	....	†6.55	*7.20	8.20		7.20	8.20	9.20	10.20	11.20	11.50	12.50
Fram. Ctr.	*5.40	6.38	7.25	8.25		7.25	8.25	9.25	s10.25	11.25	12.05	1.05
Fayville	*5.50	6.48	7.35	8.35		7.35	s8.35	9.35	s10.35	11.35	....	....
Westboro	*5.58	8.56	7.48	8.48		7.48	s8.48	9.48	s10.48	11.48	....	....
Fairlawn	*6.10	7.08	8.00	9.00		8.00	s9.00	10.00	s11.00	12.00	....	....
WORCESTER	*6.20	7.20	8.10	9.10		8.10	s9.10	10.10	s11.10	12.10	....	....

s—Runs Saturdays, Sundays, Holidays only.

*—Does not run on Sundays and Holidays.

†—Leaves Framingham 6.30 a.m. on week days.

Coaches from Worcester to Springfield at 15 min. past the odd hours via Worcester St. Ry. 7.15 a.m. to 9.15 p.m.

Coaches from Worcester to Springfield on the even hours via The Short Line 8.00 a.m. to 10.00 p.m.

Coaches leaving Boston for Worcester 9.30 a.m. to 6.30 p.m. on week days are express to Wellesley Hills Sq., taking passengers going to Wellesley Hills Sq. or points beyond.

OCTOBER 1949 (B, W & NY ST. RY)

WORCESTER—MARLBORO—BOSTON

VIA POST ROAD

DAILY

Stations		A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Lv. WORCESTER		....	....	....	7 00	....	8 00	9 00	10 00	11 00	12.00	1.00	3.00	2.00	4.00	8.00	6.00	7.00	8.00	8.00	10.00	11.00
Fairlawn		....	....	....	7 10	....	8 10	9 10	10.10	11 10	12.10	1.10	3.10	2.10	4.10	8.10	6.10	7.10	8.10	8.10	10.10	11.10
Shrewsbury		....	....	....	7.16	....	8 16	9 16	10.16	11.16	12.16	1.16	3.16	2.16	4.16	8.16	6.16	7.16	8.16	8.16	10.16	11.16
Northboro		....	....	†	7.27	....	8.27	9 27	10 27	11 27	12.27	1.27	3.27	2.27	4.27	8.27	6.27	7.27	8.27	8.27	10.27	11.27
MARLBORO		*6.35	8 35	7.10	7 40	*8.10	8 40	9 40	10.40	11 40	12.40	1.40	3.40	2.40	4.40	8.40	6.40	7.40	8.40	8.40	10.40	11.40
Wayside Inn			8 45	7.20	7 50	*8.20	8 50	9 50	10 50	11.50	12.50	1.50	3.50	2.50	4.50	8.50	6.50	7.50	8.50	8.50	10.50	11.50
So. Sudbury	Via Turnpike		8 50	7.25	7 55	*8.25	8 55	9 55	10 55	11.55	12.55	1.55	3.55	2.55	4.55	8.55	6.55	7.55	8.55	8.55	10.55	11.55
Wayland			8.55	7 30	8 00	*8.30	9 00	10 00	11 00	12.00	1.00	2.00	4.00	3.00	5.00	9.00	7.00	8.00	9.00	10.00	11.00	12.00
Weston			7.02	7 37	8 07	*8.37	9 07	10 07	11.07	12.07	1.07	2.07	4.07	3.07	5.07	9.07	7.07	8.07	9.07	10.07	11.07	12.07
Waltham			7 12	7 47	8 17	*8.47	9 17	10 17	11.17	12.17	1.17	2.17	4.17	3.17	5.17	9.17	7.17	8.17	9.17	10.17	11.17	12.17
Watertown			7 22	7 57	8 27	*8.57	9 27	10 27	11.27	12.27	1.27	2.27	4.27	3.27	5.27	9.27	7.27	8.27	9.27	10.27	11.27	12.27
Ar. BOSTON		*6.05	7.45	8.20	8 50	*9.20	9 50	10 50	11.50	12.50	1.50	2.50	4.50	3.50	5.50	9.50	7.50	8.50	9.50	10.50	11.50	12.50

*—Does not run Sundays or holidays.

Note—Buses stop between Waltham, Watertown and Boston only to discharge passengers.

†—Does not run Saturdays, Sundays or holidays.

BOSTON—MARLBORO—WORCESTER

VIA POST ROAD

DAILY

Stations	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	Mid.			
Lv. BOSTON	7 00	8 00	9 00	10 00	11 00	12.00	1.00	2.00	5.00	4.00	5.00	6.00	7.00	8.00	8.00	10.00	11.50	12.00	....	....	....
Watertown	7 23	8 23	9 23	10 23	11 23	12.23	1.25	2.25	6.23	4.28	5.23	6.25	7.23	8.23	9.23	10.25	11.55	12 23	....	....	....
Waltham	7 33	8 33	9 33	10 33	11 33	12.33	1.33	2.35	5.33	4.55	5.33	6.33	7.53	8.33	9.33	10.53	12.03	12.33	....	....	....
Weston	7 43	6 43	9 43	10 43	11 43	12.43	1.43	2.45	6.48	4.45	5.43	6.45	7.43	8.45	9.45	10.43	12.13	12 43	....	....	....
Wayland	7.50	8 50	9 50	10 50	11 50	12.50	1.50	2.50	6.50	4.50	5.50	6.50	7.50	8.50	8.50	10.50	12.20	12.50	....	....	....
So. Sudbury	7 55	8 55	9 55	10 55	11 55	12.55	1.55	2.55	6.55	4.55	5.55	6.55	7.55	8.55	8.55	10.55	12.25	12.55	....	....	....
Wayside Inn	8 00	9 00	10 00	11 00	12.00	1.00	2.00	6.00	4.00	5.00	6.00	7.00	8.00	8.00	10.00	11.00	12 30	1.00	....	....	....
MARLBORO	8 10	9 10	10 10	11 10	12.10	1.10	2.10	5.10	4.10	5.10	6.10	7.10	8.10	8.10	10.10	11.10	12.35	1.10	....	....	....
Northboro	8 23	9 23	10 23	11 23	12.23	1.23	2.23	5.23	4.23	5.25	6.25	7.23	8.23	8.23	10.23	11.25	12.48	....	....	....	....
Shrewsbury	8 32	9 32	10 32	11 32	12.32	1.32	2.32	5.32	4.52	5.32	6.32	7.32	8.52	8.32	10.52	11.32	12 57	....	....	....	....
Fairlawn	8 40	9 40	10 40	11 40	12.40	1.40	2.40	6.40	4.40	5.40	6.40	7.40	8.40	8.40	10.40	11.40	1.05	....	....	....	....
Ar. WORCESTER	8.50	9.50	10.50	11 50	12.50	1.50	2.50	6.50	4.50	5.50	6.50	7.50	8.50	9.50	10.50	11.50	1.15	....	....	....	....

Note—Buses stop between Boston, Watertown, Waltham for passengers whose destination is beyond Waltham-Weston line.

†—Does not run Saturdays, Sundays or holidays.

HUDSON—MARLBORO

VIA CHAPIN ROAD

DAILY

Stations	A.M.	A.M.	A.M.	A.M.		P.M.	P.M.	A.M.
Lv. Cox St., Hudson.	*8 10	†7.15	†8 00	9 00	Every	10.00	11.00	....
HUDSON	*8 20	†7.20	†8 20	9 20	Hour	10.20	11.20	1.00
Ar. MARLBORO	*6 35	†7 35	†8.35	9.35	Until	10.55	11.55	1.15

* Does not run on Sundays or holidays.

† Does not run to or from Cox St. on Sundays or holidays.

MARLBORO—HUDSON

VIA CHAPIN ROAD

DAILY

Stations	A.M.	A.M.	A.M.	A.M.	A.M.		P.M.	A.M
Lv. MARLBORO	*5 50	*6.55	†7.10	8.10	9.10	Every	11.10	12 40
HUDSON	*8.05	*7.10	†7.25	8.25	9 25	Hour	11.25	12 55
Ar. Cox St.	*8.10	*7.15	....	*8.30	9.30	Until	11.50	1.00

*—Does not run on Sundays or holidays.

†—Runs on Sundays only.

Note: Marlboro 6.40 a.m. to Hudson via Fitchburg St., week days except Saturday.

HUDSON—MARLBORO

VIA BOLTON STREET

DAILY

Stations	A.M.	A.M.	A.M.	A.M.		P.M.	P.M.
Lv. Cox St., Hudson	†6 50	....	*8.30	9 30	Every	10.30	11.80
HUDSON	†6 55	*7.50	*8 50	9 50	Hour	10.50	11.50
Ar. MARLBORO	†7.10	*6 05	69.05	10.05	Until	11.05	12.05

† Week days except Saturday.

* Does not run Sundays or holidays.

MARLBORO—HUDSON

VIA BOLTON STREET

DAILY

Stations	A.M.	A.M.	A.M.	A.M.		P.M.	P.M
Lv. MARLBORO	*7.40	6.40	9.40	10.40	Every	10.40	11.40
HUDSON	*7.55	8.55	9.55	10 55	Hour	10.55	11.55
Ar. Cox St., Hudson	*8 00	9 00	10.00	11.00	Until	11.00	12.00

*—Does not run Sundays or holidays.

NOV. 1, 1957 (B.W. & NY. ST. RY)

WORCESTER - MARLBORO - BOSTON

VIA POST ROAD

WEEK DAY SCHEDULE

	A.M.	A.M.	A.M.	A.M.	A.M	A.M	A.M		P.M.
Lv Worcester					7 00		8 00		3 00
Lv Fairlawn					7 10		8 10		3 10
Lv Shrewsbury					7 18		8 18		3 18
Lv Northboro					7 27		8 27	Every Hour Until	3 27
Lv Marlboro	5 35	6 35		*7 10	7 40		8 40		3 40
Lv Wayside Inn	5 45	6 45		*7 20	7 50		8 50		3 50
Lv So Sudbury	5 50	6 50		*7 25	7 55		8 55		3 55
Lv Wayland	5 55	6 55		*7 30	8 00		9 00		4 00
Lv Weston	6 02	7 02		*7 37	8 07		9 07		4 07
Ar. Waltham	6 17	7 12		*7 47	8 17		9 17		4.17
Ar Watertown	6 27	7 22		*7 57	8 27		9 27		4 27
Ar. Boston, Park Sq	6 45	7 45		*8 20	8 50		9 50		4 50

● ● ● ● ● ● ● ● ●

	P M	P M	P M	P M	P M	P M	P M	P M.	MID.
Lv Worcester	4 10	5 10	6 10	7 00	8 00	9 00	10 00	11 00	12 00
Lv Fairlawn	4 25	5 25	6 25	7 10	8 10	9 10	10 10	11 10	12 10
Lv Shrewsbury	4 33	5 33	6 33	7 18	8 18	9 18	10 18	11.18	12 18
Lv Northboro	4 42	5 42	6 42	7 27	8 27	9 27	10 27	11 27	12 27
Lv Marlboro	4 55	5 55	6 55	7 40	8 40	9 40	10 40	11.40	12 40
Lv Wayside Inn	5 05	6 05	7 05	7 50		9 50			
Lv So Sudbury	5 10	6 10	7 10	7 55		9 55			
Lv Wayland	5 15	6 15	7 15	8 00		10 00			
Lv Weston	5 22	6 22	7 22	8 07		10 07			
Ar Waltham	5 32	6 32	7 32	8 17		10 17			
Ar Watertown	5 42	6 42	7 42	8 27		10 27			
Ar Boston	6 05	7 05	8 05	8 50		10 50			

(*Extra Trips)—Run on Monday thru Friday

Note Eastbound trips stop between Waltham, Watertown and Boston only to discharge passengers

BOSTON - MARLBORO - WORCESTER

VIA POST ROAD

WEEK DAY SCHEDULE

	A.M	A.M	A.M.	A.M.		P.M.	P.M.	P.M.
Lv. Boston, Park Sq.			7 00	8 00		3 00	4 00	*4 45
Lv. Watertown			7 21	8 21		3 21	4 21	*5 08
Lv Waltham			7 29	8 29		3 29	4 29	*5 18
Lv. Weston			7 39	8 39	Every Hour Until	3 39	4 39	*5 25
Lv Wayland			7 46	8 46		3 46	4 46	*5 35
Lv So Sudbury			7 51	8 51		3 51	4 51	*5 40
Lv Wayside Inn			7.56	8 56		3 56	4 56	*5 45
Lv Marlboro	5 55	6 55	8 05	9 05		4 05	5 05	*5 55
Lv Northboro	6 08	7 08	8 21	9 21		4 21	5 21	
Lv. Shrewsbury	6.17	7 17	8 32	9 32		4 32	5 32	
Lv. Fairlawn	6 25	7 25	8 40	9 40		4 40	5.40	
Ar. Worcester	6 35	7.35	8 50	9 50		4.50	5.50	

● ● ● ● ● ● ● ●

	P M	P.M	P.M.	P.M	P M	P M.	P.M.	P.M.
Lv. Boston, Park Sq.	5 00	*5 30	6 00	7.00	8 00	9 00	10.00	11 00
Lv. Watertown	5 21	*5 53	6 21	7.21	8 21	9 21	10 21	11 21
Lv Waltham	5 29	*6 03	6 29	7.29	8 29	9 29	10 29	11.29
Lv Weston	5 39	*6 13	6 39	7 39	8 39	9 39	10 39	11.31
Lv. Wayland	5 46	*6 20	6 46	7 46	8 46	9 46	10 46	11 46
Lv So Sudbury	5 51	*6 25	6 51	7 51	8 51	9 51	10 51	11 51
Lv. Wayside Inn	5 56	*6 30	6 56	7.56	8 56	9.56	10 56	11 56
Lv. Marlboro	6 05	*6 40	7.05	8 05	9 05	10 05	11.05	12 05
Lv Northboro	6 21		7 21	8 21	9 21	10 21	11.21	
Lv Shrewsbury	6 32		7 32	8 32	9 32	10.32	11.32	
Lv Fairlawn	6 40		7.40	8 40	9 40	10.40	11 40	
Ar. Worcester	6.50		7.50	8 50	9 50	t0.50	11.50	

(*Extra Trips)—Run on Monday thru Friday

Note: Waltham-Weston Line is first stop for discharging passengers on Westbound trips.

BOSTON - MARLBORO - WORCESTER

VIA POST ROAD

SUNDAY & HOLIDAY SCHEDULE

	A.M	A.M.	A.M.		P.M	P.M	P.M.	MID.
Lv Boston, Park Sq			8 00		10 00	11 00	11 30	12 00
Lv. Watertown			8 21		10 21	11 21	11 51	12 21
Lv Waltham			8 29		10 29	11 29	11 59	12 29
Lv Weston			8 39		10 39	11 39	12 09	12 39
Lv. Wayland			8 46	Every Hour Until	10 46	11 46	12.16	12 46
Lv. So. Sudbury			8 51		10 51	11 51	12 21	12 51
Lv Wayside Inn			8 56		10 56	11 56	12 26	12 56
Lv Marlboro	7 05	8 05	9 05		11 05	12 05	12 35	1 05
Lv Northboro	7 21	8 21	9 21		11 21			
Lv. Shrewsbury	7.32	8 32	9 32		11 32			
Lv. Fairlawn	7 40	8 40	9 40		11 40			
Ar. Worcester	7.50	8 50	9 50		11 50			

Note—Waltham - Weston Line is first stop for discharging passengers on Westbound Trips

● ● ● ● ● ● ● ●

WORCESTER - MARLBORO - BOSTON

VIA POST ROAD

SUNDAY & HOLIDAY SCHEDULE

	A.M.	A.M.	A.M.		P M	P.M	P M.	MID.
Lv. Worcester			8 00		9 00	10 00	11 00	12 00
Lv. Fairlawn			8 10		9 10	10 10	11 10	12 10
Lv. Shrewsbury			8 18		9 18	10 18	11.18	12 18
Lv. Northboro			8 27	Every Hour Until	9 27	10 27	11 27	12 27
Lv. Marlboro	6 35	7 35	8 40		9 40	10 40	11 40	12 40
Lv. Wayside Inn	6 45	7 45	8 50		9 50	10 50		
Lv So. Sudbury	6 50	7.50	8 55		9 55	10 55		
Lv. Wayland	6 55	7.55	9 00		10 00	11 00		
Lv. Weston	7 07	8 02	9 07		10 07	11.07		
Ar. Waltham	7 12	8 12	9 17		10 17	11.17		
Ar. Watertown	7 22	8 22	9 27		10 27	11.27		
Ar. Boston, Park Sq	7.45	8 45	9.50		10 50	11 50		

Note—East bound trips stop between Waltham and Boston only to discharge passengers.

June 11, 1973

M – Monday-Friday Only
S – Saturday Only

EFFECTIVE:
June 11, 1973

THE GRAY LINE
PASSENGER SCHEDULE

For Information Call:
Boston: 482-6620
Fram: 879-7355
Worc: 754-2611

NO SERVICE ON SUNDAYS AND HOLIDAYS

BOSTON TO WORCESTER (VIA POST ROAD)

Read Down	AM	AM	AM	PM	PM	PM	PM	PM	PM	PM
Haymarket								5:10*		
So. Station								5:20	5:30*	
Park Square	7:00	9:00	11:00	1:00	3:00	5:00	5:00*		5:40	7:15
Watertown	7:15	9:15	11:15	1:15	3:15	5:20				7:30
Waltham	7:25	9:25	11:25	1:25	3:25	5:30				7:40
Weston	7:35	9:35	11:35	1:35	3:35	5:40	5:25		6:05	7:50
Wayland	7:42	9:42	11:42	1:42	3:42	5:47	5:32	6:00	6:12	7:57
So. Sudbury	7:47	9:47	11:47	1:47	3:47	5:52	5:37	6:05	6:17	8:02
Wayside Inn	7:52	9:52	11:52	1:52	3:52	5:57	5:42		6:22	8:07
Marlboro	8:02	10:02	12:02	2:02	4:02	6:07	5:52	6:20	6:32	8:17
Northboro	8:15	10:15	12:15	2:15	4:15	6:20				
Shrewsbury	8:24	10:24	12:24	2:24	4:24	6:29				
Fairlawn	8:32	10:32	12:32	2:32	4:32	6:37				
Worcester	8:45	10:45	12:45	2:45	4:45	6:45				
	M	S	M	S	M	S	M	M	M	M

*All trips go via Watertown Square except those marked with Asterisk, which go via Weston.

WORCESTER TO BOSTON (VIA POST ROAD)

Read Down	AM	AM	AM	AM	AM	AM	PM	PM	PM	PM	PM
Worcester			6:50*	7:00	9:00	11:00	1:00	3:00	5:15		7:00
Fairlawn			7:00	7:10	9:10	11:10	1:10	3:10	5:25		7:10
Shrewsbury			7:08	7:18	9:18	11:18	1:18	3:18	5:33		7:18
Northboro			7:17	7:27	9:27	11:27	1:27	3:27	5:42		7:27
Marlboro	6:50	7:00*	7:30	7:40	9:40	11:40	1:40	3:40	5:55	6:30	7:40
Wayside Inn	7:00	7:10	7:40	7:50	9:50	11:50	1:50	3:50	6:05	6:40	7:50
So. Sudbury	7:05	7:15	7:45	7:55	9:55	11:55	1:55	3:55	6:10	6:45	7:55
Wayland	7:10	7:20	7:50	8:00	10:00	12:00	2:00	4:00	6:15	6:50	8:00
Weston	7:17	7:27	7:57	8:07	10:07	12:07	2:07	4:07	6:22	6:57	8:07
Waltham	7:27			8:17	10:17	12:17	2:17	4:17	6:32	7:07	8:17
Watertown	7:37			8:27	10:27	12:27	2:27	4:27	6:42	7:17	8:27
Park Square	7:55	7:55	8:25	8:45	10:45	12:45	2:45	4:45	6:55	7:35	8:45
So. Station	8:00	8:00									
Haymarket	8:05	8:05									
	M	M	M	S	M	S	M		M	M	S

FEB 28, 1977

RITCHIE BUS LINES.

BOSTON - MARLBORO - NORTHBORO

Monday thru Friday Only

TRIP NUMBER		401 AM	403 PM	405 PM	407 PM
Haymarket				5 10	
South Station				5 20	5 30
Boston		9 00	5 00		5 45
Newton Corner		9 15			6 00
Weston		9 30	5 30	5 50	6 15
Wayland		9 35	5 35	5 55	6 20
South Sudbury		9 40	5 40	6 00	6 25
Marlboro		9 50	5 50	6 10	6 35
Northboro		10 00	6 00	6 20	6 45
TRIP NUMBER	**100 AM**	**202 AM**	**204 AM**	**206 PM**	
Northboro	6 30	6 50	7 15	3 30	
Marlboro	6 40	7 00	7 25	3 40	
South Sudbury	6 50	7 10	7 35	3 50	
Wayland	6 55	7 15	7 40	3 55	
Weston	7 00	7 20	7 45	4 00	
Newton Corner	7 15 M				
Boston	x 7 30	x 7 50	x 8 15	4 30	

REFERENCE

x ADDITIONAL stops at South Station and Haymarket Square.

TRIP NUMBER 100 OPERATES AS AN EXTRA TRIP SUBJECT TO CANCELLATION WITHOUT NOTICE.

NO SUNDAY OR HOLIDAY SERVICE.

CANCELLATION OF SERVICE - In the event that weather conditions warrant the cancellation of Bus Service, notice will be announced over the following radio stations: (Marlboro) WSRO-1470, (Framingham) WKOX-1190, (Boston) WBZ-1030.

M – Connects in Newton Corner with MBTA to all points in Newton, Watertown, Waltham, etc.

NO SMOKING on buses – State Law.

DRIVER MAY NOT change bills over $5.00

BOSTON - MARLBORO - WORCESTER

Saturday Only

TRIP NUMBER		301 AM	303 PM	
Boston		10 45	1 45	
Newton Corner		11 00	2 00	
Weston		11 15	2 15	
Wayland		11 20	2 20	
South Sudbury		11 25	2 25	
Marlboro		11 35	2 35	
Northboro		11 45	2 45	
Shrewsbury		11 50	2 50	
Worcester		12 00	3 00	
TRIP NUMBER	**300 AM**	**302 PM**	**304 PM**	
Worcester		12 15	3 15	
Shrewsbury		12 25	3 25	
Northboro	9 30	12 30	3 30	
Marlboro	9 40	12 40	3 40	
South Sudbury	9 50	12 50		
Wayland	9 55	12 55		
Weston	10 00	1 00		
Newton Corner *	M–*	M–*		
Boston	10 30	1 30		

* WILL OPERATE THRU NEWTON CORNER ON REQUEST TO BUS DRIVER.

NORTHBORO - SHOPPERS WORLD

Saturday Only

TRIP NUMBER	602 AM	604 PM		
Northboro	9 00	3 30		
Hudson	9 15	3 40		
Marlboro	9 30	3 50		
Southboro	9 40	4 00		
Shoppers World	9 50	4 10		
TRIP NUMBER	**601 AM**	**603 PM**		
Shoppers World	10 00	4 15		
Southboro	10 10	4 25		
Marlboro	10 20	4 35		
Hudson		4 45		
Northboro	10 30	5 00		

10/19/82

THE GRAY LINE INC.

WORCESTER - BOSTON
1-STOP SERVICE

	M*	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Worcester	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00
Shopper's World	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30	7:30	8:30	9:30
Boston	8:15	9:15	10:15	11:15	12:15	1:15	2:15	3:15	4:15	5:15	6:15	7:15	8:15	9:15	10:15

M* 7:00 and 8:00 Worcester-Boston Monday thru Friday Non-Stop arriving in Boston at 7:55 A.M. and 8:55 A.M.
M Monday-Sunday

BOSTON - WORCESTER
1-STOP SERVICE

	M	M	M	M	M	M	M	M	M	M	M	M*	M	M	M	M	M
Boston	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30	7:30	8:30	9:30	10:30
Shopper's World	6:55	7:55	8:55	9:55	10:55	11:55	12:55	1:55	2:55	3:55	4:55	5:55	6:55	7:55	8:55	9:55	10:55
Worcester	7:40	8:40	9:40	10:40	11:40	12:40	1:40	2:40	3:40	4:40	5:40	6:40	7:40	8:40	9:40	10:40	11:40

M - Monday-Friday M* - Monday-Friday Local to Worcester and Saturday and Sunday 1 stop only.

Worcester - Boston Commuter
6:30 A.M with Boston Local to Exit 12, then Express to Boston
Runs Monday-Friday Only

Boston - Worcester Commuter
5:30 P M Boston - Worcester Non-Stop
Runs Monday-Friday Only.

COMMUTER SERVICE
Framingham - Boston A.M. Service

6:15 WAT	6:30 SW Park Sq. - So. Station
	6:50 SW Park Sq. - So. Station
*6:45 WAT	7:05 SW Park Sq. - So. Station
	7:00 WS Park Sq. - So. Station
	7:15 SW Park Sq. - State Capitol
	7:30 SW Park Sq. - State Capitol
	7:30 SW Park Sq. - So. Station
7:15 WAT	7:40 SW Park Sq. - State Capitol
*7:10 Levitts Westboro	7:45 SW Park Sq. - So. Station
	7:50 SW Copley Sq. - Park Sq. - So. Station
	8:00 SW Park Sq. - State Capitol
	8:15 SW Park Sq. - State Capitol
	8:30 SW Park Sq. - State Capitol
	8:45 SW Park Sq. - State Capitol
8:40 WAT	9:00 SW Park Sq.

The above runs operate Mon.-Fri. only
*Connects for Logan at South Station Terminal

Boston - Framingham P.M. Service

3:30	Park Square - Exit 12
4:00	Park Square - Exit 12
4:30	Park Square - Exit 12
4:45	Park Square - Exit 12
5:00	Park Square - Exit 12
5:00	Park Square - Exit 12
5:15	Park Square - Exit 12
5:10	So. Station 5:20 Park Square - Exit 12
5:10	Copley Square - Levitts Westboro
5:30	Park Square - Exit 12
5:45	Park Square - Exit 12
6:00	Park Square - Exit 12
6:30	Park Square - Exit 12

Worcester - Logan Service

Worcester	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	4:00	5:00	6:00	7:00
SW	7:05	7:45	9:30	10:30	11:30	12:30	1:30	2:30	4:30	5:30	6:30	7:30
Logan	8:25	9:15	10:30	11:30	12:30	1:30	2:30	3:30	5:30	6:30	7:30	8:30

Logan - Worcester Service

Logan	8:50	8:50	10:50	11:50	12:50	1:50	2:50	3:50	5:50	6:50	7:50	8:50
SW	9:56	10:56	11:56	12:56	1:56	2:56	3:56	4:56	6:56	7:56	8:56	9:56
Worcester	10:40	11:40	12:40	1:40	2:40	3:40	4:40	5:40	7:40	8:40	9:40	10:40

ROUTE 20

AM MARLBORO-BOSTON			PM BOSTON-MARLBORO		
NORTHBORO	6:30 AM		GOVERNMENT CTR.	5:40 PM	
MARLBORO	6:40 AM	7:15 AM	SOUTH STATION	5:20 PM	
SUDBURY	6:50 AM	7:25 AM	PARK SQ.	4:40 PM	5:20 PM
WAYLAND	7:00 AM	7:35 AM	WESTON	5:15 PM	5:50 PM
WESTON	7:15 AM	7:48 AM	WAYLAND	5:20 PM	5:55 PM
PARK SQ.	7:45 AM	8:18 AM	SUDBURY	5:30 PM	6:00 PM
SOUTH STA.	7:50 AM	8:15 AM	MARLBORO	5:40 PM	6:10 PM
GOV CTR.	7:55 AM	8:25 AM	NORTHBORO		6:20 PM

*This service via Rt. 9 to Rt. 85 and into Marlboro.
Marlboro passengers can board Commuter Buses leaving the Terminal at 321** Iple St. (Rt 85) every 15 minutes starting at 6:00 AM to 7:00 AM

Milford Framingham Bus Line
School Buses
Charter Buses
881-4627

P. O. Box 321
Ashland, Mass. 01721

MARLBORO TO BOSTON VIA THE POST ROAD

MORNING DEPARTURES		GOVERNMENT CENTER & SOUTH STATION	PARK SQUARE & COPLEY SQUARE	EVENING DEPARTURES	
NORTHBORO	6:45 AM	$3.90	$3.60	5:05 PM	Gov Center - JFK Building Across from Capitol Bank
MARLBORO	6:53 AM	3.60	3.30	5:20	South Station - Corner of Essex St. & Surface Artery
SUDBURY	7:08 AM	3.30	3.00	5:30	Park Square - near statue
WAYLAND	7:13 AM	2.85	2.55	5:35	Copley Square - across from Hotel - on St. James Ave.
WESTON	7:23 AM	2.65	2.40		

9/20/85

BIG W TRANS, INC. POST ROAD LINE

NORTHBOROUGH TO BOSTON VIA THE BOSTON POST ROAD

EFFECTIVE JANUARY 1, 1990

			AM READ DOWN		PM READ UP	
NORTHBOROUGH	RTE 135 & 20	LV	6:45	AM	ARR 6:45	PM
MARLBOROUGH	SR CTR MAIN ST.		6:55		6:30	
RTE 20 EAST	DUNKIN' DONUTS		6:58		6:25	
SUDBURY	FRIENDLY'S		7:10		6:20	
WAYLAND	UNITARIAN CHURCH		7:15		6:10	
WESTON	PUBLIC LIBRARY		7:25		6:05	
COPLEY SQ, BOSTON		ARR	7:45	AM	LV 5:35	PM
PARK SQ, TRANSP. BLDG			7:50		5:30	
SOUTH STATION			8:00	ESSEX & S.A.	5:20	
GOVT CTR, JFK NEW SUDBURY ST.			8:10		5:05	

FARE SCHEDULE

	COPLEY & PARK SQ.	SOUTH STA & GOVT CTR
NORTHBOROUGH	$ 3.85	$ 4.15
MARLBOROUGH	3.65	3.85
SUDBURY	3.25	3.65
WAYLAND	2.75	3.25
WESTON	2.65	2.90

LOCAL FARES $ 1.25 MINIMUM, PLUS $.50 PER TOWN PASSED THROUGH.
BUS MAKES "FLAG" STOPS ALONG ROUTE 20 AND WITHIN BOSTON.
TIMES ARE APPROXIMATE AND CAN VARY DEPENDING ON TRAFFIC AND
WEATHER CONDITIONS. NO SERVICE SATURDAYS, SUNDAYS OR HOLIDAYS.

FOR INFORMATION AND CHARTER BUSES CALL (508) 881-4627

Appendix E

MDPW Chapter 30, Section 61, Findings for Developments Along Route 20

The Commonwealth of Massachusetts
Executive Office of Transportation and Construction
Department of Public Works
Ten Park Plaza, Boston 02116-3973

January 4, 1990

Mr. Harold Nahigian
16A Mount Auburn Street
Cambridge, MA 02138

Dear Mr. Nahigian:

Please find attached the MDPW Chapter 30, Section 61 Finding for the Post Road Shopping Center project (EOEA #6421) in Marlborough. The finding will be incorporated into MDPW permits issued for this project. If you or your staff have any questions regarding this finding, please give me a call at 973-8137.

Sincerely,

Thomas F. McLoughlin, Manager
Public/Private Development Unit

cc: Jane F. Garvey, Commissioner
Robert H. Johnson, Chief Engineer
Michael L. Burke, Director, BTP&D
Anthony Buccitelli, Chief Counsel
Robert Sloane, Deputy Secretary, EOTC
Janet McCabe, Assistant Secretary, EOEA
Joseph McCarthy, Permit Engineer
Paul Carr, DHE, District 3
Peter Donohue, DHE, District 4
David Parry, City Planner, Marlborough
MAPC
Larry Berkowitz, BTP&D (2 copies)

FINDING OF THE MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
PURSUANT TO M.G.L. CHAPTER 30, SECTION 61

PROJECT NAME: Post Road Shopping Center

PROJECT LOCATION: Marlborough, Route 20

PROJECT PROPONENT: Harold Nahigian

MEPA NUMBER: 6421

I. Project Description

The proposed project involves the expansion of an existing shopping center in Marlborough, MA. The expansion will consist of 77,496 square feet of retail space and a 24,558 square foot movie theatre. The retail/theatre expansion will be located on the north side of Route 20 (East Main Street) between Clinton and Hosmer Streets, on a 27.2-acre parcel. The retail/theatre expansion will provide 693 parking spaces and is estimated to have a cost of approximately 5.3 million dollars.

The project proponent has applied to the Massachusetts Department of Public Works for permits under M.G.L. c. 81, § 21 for access to Route 20 and for traffic signal permits to be issued to the Town of Marlborough under M.G.L. c. 85, § 2.

The proponent prepared and submitted, pursuant to M.G.L. c. 30, § 61 and 62A-H of the Massachusetts Environmental Policy Act, a Draft Environmental Impact Report (July 1987) a Final Environmental Impact Report (November 1987) and a Supplemental Final Environmental Impact Report (August 1988). On September 30, 1989 the Secretary of Environmental Affairs issued a certificate that the SFEIR adequately and properly complied with MEPA and its implementing regulations.

The MDPW has reviewed and commented on the above MEPA submissions and has considered the comments of various parties on the EIRs, in connection with the permit applications submitted by the proponent. In addition, the MDPW has also considered the information contained in the EIRs for the Indian Hill Park development (EOEA# 5839), the Route 20 corridor study conducted by Vanasse Hangen Brustlin, Inc., and additional analysis conducted by the Central Transportation Planning Staff. This Section 61 Finding is accordingly based upon information disclosed and discussed in the MEPA process.

II. Overall Project Impacts

Full-build construction of the retail/theatre expansion is projected to create an additional 9,664 vehicle-trips[1] to and from the site during an average weekday, including 902 vehicle-trips (in and out) per hour in the weekday PM peak hour. The cumulative impacts on the surrounding regional roadway network from Post Road Shopping Center combined with Indian Hill Park have been assessed by the MDPW, because both developments impact the same intersections along Route 20 in Marlborough.

Mitigation required in this Section 61 Finding for the Post Road Shopping Center project will also mitigate the traffic impacts due to Indian Hill Park. The Indian Hill Park proponent will implement additional mitigation that will also mitigate traffic impacts due to Post Road Shopping Center. The MDPW issued an amended Section 61 Finding for the Indian Hill Park project dated January 3, 1990, prior to issuance of necessary MDPW permits for the Indian Hill Park project.

In the absence of any mitigating highway improvements, Post Road Shopping Center traffic would be expected to have generally detrimental congestion and safety impacts in a number of primary areas. These include: the Route 20/Primary Site Drive intersection, the Route 20/Lincoln Street/Stevens Street intersection, the Route 20/Farm Road/Wilson Street intersection, the Route 20/Hager Street/Wayside Inn Road intersection, the Route 20/Hosmer Street intersection, the Route 20/Indian Hill East Site Access Drive intersection, and the Route 20/Indian Hill West Site Access Drive intersection. The specific impacts on each of these intersections and the mitigation measures required to address them are detailed in Part III of the Finding.

III. Specific Project Impacts and Mitigation Measures

The MDPW has analyzed the safety and congestion impacts in the affected highway area due to the proposed Post Road Shopping Center and the Indian Hill Park project, and has determined that the mitigation measures outlined below are required of Post Road Shopping Center, in order to minimize the traffic impacts of this development. Discussions have been held with the Post Road Shopping Center proponent regarding mitigation measures and the Post Road Shopping Center proponent has committed to undertake the following mitigation measures.

---

[1] Technical terms used in this Finding are as defined in the Transportation Research Board Highway Capacity Manual (1985).

Route 20/Primary Site Drive intersection

For the 1995 No-Build scenario, weekday PM peak hour LOS for the critical vehicle movement at this unsignalized intersection (the Route 20 Eastbound left-turn) will be at Level F (Reserve Capacity = -157). The 1995 Build scenario without traffic mitigation indicates that LOS for the critical vehicle movement at this intersection will remain at Level F (Reserve Capacity = -559) during the weekday PM peak hour. With mitigation in place, the 1995 Build scenario indicates that the intersection will operate at LOS D during the weekday PM peak hour.

In order to avoid potential adverse traffic safety impacts at this location, the proponent will locate the Primary Site Drive opposite Curtis Avenue and design this intersection to incorporate the following: Eastbound (an exclusive left-turn lane (minimum length = 500 feet), a through-lane and a through/right-turn lane entering the intersection; Westbound (an exclusive left-turn lane (minimum length = 100 feet), two through-lanes and an exclusive right-turn lane entering the intersection); Southbound (two exclusive left-turn lanes and an exclusive right-turn lane with a standard acceleration lane); and, Northbound (Curtis Avenue: an exclusive right-turn lane entering the intersection).

Necessary preparation for eventual signalization that would require breaking the pavement surface, such as installing conduit, should be completed during the construction of the site access drive approach to this intersection. When signalization becomes warranted, the proponent will signalize this intersection and coordinate/interconnect this traffic signal with the signals at the Route 20/Lincoln Street/Stevens Street intersection and the Route 20/Hosmer Street intersection.

The traffic control agreement to be issued to the City of Marlborough for this intersection will specify that the city is responsible for enforcement of the prohibition of left-turns from Curtis Avenue.

Mitigation required by the MDPW for the Post Road Shopping Center project will also mitigate the traffic impacts at this location from the Indian Hill Park development. There are no additional feasible means or measures to avoid or minimize these impacts that the Post Road Shopping Center proponent could be required to implement.

Hosmer Street/Secondary Site Drive intersection

For the 1995 No-Build scenario, LOS for the intersection will be at Level E (Reserve Capacity = 68) for the weekday PM peak hour. The 1995 Build scenario without traffic mitigation

indicates that LOS for the intersection will remain at Level E (Reserve Capacity = 56) for the weekday PM peak hour.

The proponent will design this intersection in accordance with acceptable MDPW design practice.

Mitigation required by the MDPW for the Post Road Shopping Center project will also mitigate the traffic impacts at this location from the Indian Hill Park development. There are no additional feasible means or measures to avoid or minimize these impacts that the Post Road Shopping Center proponent could be required to implement.

Route 20/Lincoln Street/Stevens Street intersection

For the 1995 No-Build scenario, LOS for this signalized intersection will be at Level C for the weekday PM peak hour. The 1995 Build scenario without traffic mitigation indicates that LOS for the intersection will drop to Level E for the weekday PM peak hour. With mitigation in place, the 1995 Build scenario indicates that the intersection will operate at LOS B during the weekday PM peak hour.

Mitigation required by the MDPW for the Indian Hill Park project, as specified in the Section 61 Finding for that project dated January 3, 1990, will also mitigate the traffic impacts from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Post Road Shopping Center proponent could be required to implement.

Route 20/Farm Road/Wilson Street intersection

For the 1995 No-Build scenario, weekday PM peak hour LOS for this signalized intersection will be at Level B. The 1995 Build scenario without traffic mitigation indicates that LOS for this intersection will drop to Level F during the weekday PM peak hour. With mitigation in place, the 1995 Build scenario indicates that the intersection will operate at LOS B during the weekday PM peak hour.

Mitigation required by the MDPW for the Indian Hill Park project, as specified in the Section 61 Finding for that project dated January 3, 1990, will also mitigate the traffic impacts from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Post Road Shopping Center proponent could be required to implement.

Route 20/Hager Street/Wayside Inn Road intersection

For the 1995 No-Build scenario, weekday PM peak hour LOS for this signalized intersection will be at Level C. The 1995 Build scenario without traffic mitigation indicates that LOS for this intersection will drop to Level F during the weekday PM peak hour. With mitigation in place, the 1991 Build scenario indicates that the intersection will operate at LOS B during the weekday PM peak hour.

Mitigation required by the MDPW for the Indian Hill Park project, as specified in the Section 61 Finding for that project dated January 3, 1990, will also mitigate the traffic impacts from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Post Road Shopping Center proponent could be required to implement.

Route 20/Hosmer Street intersection

For the 1995 No-Build scenario, weekday PM peak hour LOS for this signalized intersection will be at Level B. The 1995 Build scenario without traffic mitigation indicates that LOS for this intersection will drop to Level F during the weekday PM peak hour. With mitigation in place, the 1995 Build scenario indicates that the intersection will operate at LOS C during the weekday PM peak hour.

The proponent will redesign this intersection to incorporate the following: Eastbound (an exclusive left-turn lane (minimum length = 300 feet) and two through-lanes entering the intersection and two through-lanes tapering to one exiting the intersection); Westbound (an exclusive right-turn lane (minimum length = 200 feet) and two through-lanes (minimum length = 450 feet) entering the intersection); Southbound (Hosmer Street: an exclusive right-turn lane and an exclusive left-turn lane (minimum length = 450 feet)).

The proponent will provide a new signal controller and refurbish the existing signal hardware at this intersection. In addition, the proponent will coordinate/interconnect this traffic signal with the signal at the Route 20/Post Road Shopping Center intersection.

Mitigation required by the MDPW for the Post Road Shopping Center project will also mitigate the traffic impacts at this location from the Indian Hill Park development. There are no additional feasible means or measures to avoid or minimize these impacts that the Post Road Shopping Center proponent could be required to implement.

Route 20/Indian Hill Park East Site Access Drive intersection

The 1995 Build scenario for this new intersection indicates that, weekday PM peak hour LOS for the critical vehicle movement (the Route 20 westbound left-turn) will be at Level F. With mitigation in place, the 1995 Build scenario indicates that weekday PM peak hour LOS for this intersection will be at Level B.

Mitigation required by the MDPW for the Indian Hill Park project, as specified in the Section 61 Finding for that project dated January 3, 1990, will also mitigate the traffic impacts from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Post Road Shopping Center proponent could be required to implement.

Route 20/Indian Hill Park West Site Access Drive intersection

The 1995 Build scenario for this new intersection indicates that, weekday PM peak hour LOS for the critical vehicle movement (the Route 20 westbound left-turn) will be at Level F. With mitigation in place, the 1995 Build scenario indicates that weekday PM peak hour LOS for this intersection will be at Level B.

Mitigation required by the MDPW for the Indian Hill Park project, as specified in the Section 61 Finding for that project dated January 3, 1990, will also mitigate the traffic impacts from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Post Road Shopping Center proponent could be required to implement.

Implementation of Traffic Mitigation Measures

The trips generated by the movie theatre will occur for the most part outside of the weekday PM peak hour. Therefore, the proponent may proceed with opening the movie theatre portion of the project prior to implementation of the traffic mitigation measures described above. In addition, the proponent may relocate the approximately 19,000 square feet of retail space that interferes with the relocation of the Primary Site Drive, prior to implementation of the traffic mitigation measures.

The proponent will monitor the traffic entering and exiting the site drives every six months following the issuance of the access permits for this project. The monitoring program will include 24-hour Automatic Traffic Recorder counts, recorded over a one week period. The results of these studies will be

submitted to the MDPW District 4 office within 30 days of each six month period.

Currently, about 142,000 square feet of retail space exists on the site. Prior to the opening of any additional retail square footage, beyond the movie theatre and the square footage to be relocated away from the new Primary Site Drive, the proponent will implement all necessary traffic mitigation measures.

FINDINGS

For the reasons stated above, the MDPW hereby finds that, with implementation by the proponents of the mitigation measures described above, all practicable means and measures will be taken to avoid or minimize adverse traffic and related impacts to the environment relating to the Post Road Shopping Center project. Appropriate conditions will be included in the access and traffic signal permits to be issued by the MDPW to describe more fully and ensure implementation of said measures.

1-7-99
DATE

Thomas F. McLoughlin, Manager
Public/Private Development Unit

The Commonwealth of Massachusetts
Executive Office of Transportation and Construction
Department of Public Works
Ten Park Plaza, Boston 02116-3973

August 23, 1990

Mr. Harry Mack
The Fafard Companies
290 Eliot Street
Ashland, MA 01721

Dear Mr. Mack:

Please find attached the amended MDPW Chapter 30, Section 61 Finding for the Indian Hill Park project (EOEA #5839) in Marlborough. The amended finding will be incorporated into MDPW permits issued for this project. If you or your staff have any questions regarding this finding, please give me a call at 973-8137.

Sincerely,

Thomas F. McLoughlin, Director
Public/Private Development Unit

cc: Jane F. Garvey, Commissioner
George R. Turner, Jr., Chief Engineer
Michael L. Burke, Director, BTP&D
Anthony Buccitelli, Chief Counsel
Robert Sloane, Deputy Secretary, EOTC
Janet McCabe, Assistant Secretary, EOEA
Joseph McCarthy, Permit Engineer
Peter Donohue, DHE, District 4
David Parry, City Planner, Marlborough
Ronald LaFreniere, City Engineer, Marlborough
MAPC
Larry Berkowitz, PPDU

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
AMENDED FINDING PURSUANT TO
M.G.L. CHAPTER 30, SECTION 61

This finding amends and supercedes a Section 61 Finding issued by the MDPW on January 4, 1990.

PROJECT NAME: Indian Hill Park

PROJECT LOCATION: Marlborough - Route 20

PROJECT PROPONENT: The Fafard Companies

MEPA NUMBER: 5839

I. Project Description

The proposed project is the construction of a mixed-use residential/retail development comprised of 348 condominium units and 110,000 square feet of retail space, in the City of Marlborough, Massachusetts. The mixed-use development will be located on the south side of Route 20 approximately 0.5 miles west of the Marlborough/Sudbury town line, on a 109-acre parcel. The development is estimated to have a cost of approximately 39.4 million dollars.

The project proponent has applied to the Massachusetts Department of Public Works for permits under M.G.L. c. 81, § 21 for access to Route 20 and for traffic signal permits to be issued to the Town of Marlborough under M.G.L. c. 85, § 2.

The proponent prepared and submitted, pursuant to M.G.L. c. 30, § 61 and 62A-H of the Massachusetts Environmental Policy Act, a Draft Environmental Impact Report (August 1987), a Final Environmental Impact Report (March 1988), a first Supplemental Final Environmental Impact Report (September 1988), and a second Supplemental Final Environmental Impact Report (December 1988). On March 3, 1989, the Secretary of Environmental Affairs issued a certificate that the FEIR adequately and properly complied with MEPA and its implementing regulations.

The MDPW has reviewed the information contained in the EIRs and has considered the comments of various parties on the EIRs in connection with the permit applications submitted by the proponent. In addition, the MDPW has also considered the information contained in the EIRs for the Post Road Shopping Center development (EOEA# 6421), the Route 20 corridor study conducted by Vanasse Hangen Brustlin, Inc., and additional analysis conducted by the Central Transportation Planning Staff. This amended Section 61 Finding is accordingly based upon information disclosed and discussed in the MEPA process.

II. Overall Project Impacts

Full-build construction of the mixed-use development is projected to create an additional 10,176 vehicle-trips[1] to and from the site during an average weekday, including 943 vehicle-trips (in and out) per hour in the weekday PM peak hour. The cumulative impacts on the surrounding regional roadway network from Indian Hill Park combined with Post Road Shopping Center have been assessed by the MDPW, because both developments impact the same intersections along Route 20 in Marlborough.

Mitigation required in this amended Section 61 Finding for the Indian Hill Park project will also mitigate the traffic impacts due to Post Road Shopping Center. The Post Road Shopping Center proponent will implement additional mitigation that will also mitigate traffic impacts due to Indian Hill Park. The MDPW issued a Section 61 Finding for the Post Road Shopping Center project, dated January 3, 1990, prior to the issuance of necessary MDPW permits for the Post Road Shopping Center project.

In the absence of any mitigating highway improvements, Indian Hill Park-related and Post Road Shopping Center-related traffic would be expected to have generally detrimental congestion and safety impacts in a number of primary areas. These include: the Route 20/East Site Access Drive intersection, the Route 20/West Site Access Drive intersection, the Route 20/Lincoln Street/Stevens Street intersection, the Route 20/Farm Road/Wilson Street intersection, the Route 20/Hager Street/Wayside Inn Road intersection, the Route 20/Hosmer Street intersection, and the Route 20/Post Road Shopping Center Drive intersection. The specific impacts on each of these intersections and the mitigation measures required to address them are detailed in Part III of the Finding.

III. Specific Project Impacts and Mitigation Measures

The MDPW has analyzed the safety and congestion impacts in the affected highway area due to the proposed Indian Hill Park project and the Post Road Shopping Center, and has determined that the mitigation measures outlined below are required of Indian Hill Park, in order to minimize the traffic impacts of this development. Discussions have been held with the Indian Hill Park proponent regarding mitigation measures and the Indian Hill Park proponent has committed to undertake the following mitigation measures.

---

[1] Technical terms used in this Finding are as defined in the Transportation Research Board Highway Capacity Manual (1985).

Route 20/East Site Access Drive intersection

The 1995 Build with mitigation scenario for this new intersection indicates that weekday PM peak hour LOS will be at Level B.

In order to avoid potential adverse traffic safety impacts at this intersection, the proponent will design the site access drive approach to prohibit left-turns out of the driveway. The proponent will design this intersection, in a manner acceptable to the MDPW, to incorporate the following: Eastbound (two through-lanes and an exclusive right-turn lane entering the intersection (minimum length = 200 feet) and two through-lanes exiting the intersection tying into the Raytheon improvements); Westbound (an exclusive left-turn lane and two through-lanes entering the intersection tying in from the Raytheon improvements and two through-lanes tapering to one lane exiting the intersection); and, Northbound (an exclusive right-turn lane entering the intersection.

Necessary preparation for eventual signalization that would require breaking the pavement surface, such as installing conduit, should be completed during the construction of the site access drive approach to this intersection. In addition, the proponent will allow access to the East Site Drive from the Village at Hager Meadows development located adjacent to the east side of this site drive.

Mitigation required by the MDPW for the Indian Hill Park project will also mitigate the traffic impacts at this location from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Indian Hill Park proponent could be required to implement.

Route 20/West Site Access Drive intersection

The 1995 Build with mitigation scenario for this new intersection indicates that, weekday PM peak hour LOS will be at Level B.

In order to avoid potential adverse traffic safety impacts at this location, the proponent will design this intersection to incorporate the following: Eastbound (two through-lanes and an exclusive right-turn lane entering the intersection (minimum length = 200 feet) and two through-lanes tapering to one lane exiting the intersection); Westbound (two through-lanes and an exclusive left-turn lane entering the intersection (minimum length = 200 feet) and two through-lanes tapering to one lane exiting the intersection); Northbound (two exclusive left-turn lanes and an exclusive right-turn lane entering the intersection (minimum length = 150 feet); and, Southbound (two through-lanes

extending to the proposed connector road and then tapering to one lane).

Necessary preparation for eventual signalization that would require breaking the pavement surface, such as installing conduit, should be completed during the construction of the site access drive approach to this intersection. When signalization becomes warranted, the proponent will signalize this intersection and coordinate/interconnect this traffic signal with the signals at the Route 20/Farm Road/Wilson Street intersection and the Route 20/Raytheon Entrance Drive intersection.

In addition, the proponent will allow access to the West Site Drive, at least 250 feet away from Route 20, from the Indian Head Shopping Center development located adjacent to the east side of this site drive. This will provide a facility to accommodate westbound traffic exiting the Indian Head Shopping Center.

Mitigation required by the MDPW for the Indian Hill Park project will also mitigate the traffic impacts at this location from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Indian Hill Park proponent could be required to implement.

Proposed Connector Road Access Scheme

In order to further mitigate adverse traffic safety and congestion impacts at the two site drive intersections with Route 20, the proponent will continue to work towards the creation of a Connector Road access scheme (creating an internal traffic circulation pattern by connecting the two driveways on-site) for this project. The creation of this internal circulation pattern will reduce the need for Route 20 left-turn movements at one of the site drive intersections with Route 20 and, therefore, further improve operations at these intersections.

The proponent will reserve the on-site right-of-way (ROW) for this Connector Road now. When the remainder of the necessary ROW becomes available in the future, the proponent will then construct the portions of the Connector Road on the reserved on-site ROW.

Route 20/Lincoln Street/Stevens Street intersection

For the 1995 No-Build scenario, LOS for this signalized intersection will be at Level C for the weekday PM peak hour. The 1995 Build scenario without traffic mitigation indicates that LOS for the intersection will drop to Level E for the weekday PM peak hour. With mitigation in place, the 1995 Build scenario

indicates that the intersection will operate at LOS B during the weekday PM peak hour.

The proponent will redesign this intersection to incorporate the following: Eastbound (two through-lanes (minimum length = 250 feet) entering the intersection and two through-lanes exiting the intersection tying to the Post Road Shopping Center improvements); Westbound (one through lane and an exclusive left-turn lane (minimum length of left-turn lane = 250 feet) entering the intersection); Northbound (one through lane and an exclusive right-turn lane (minimum length of right-turn lane = 300 feet) entering the intersection); and, Southbound (one through/right-turn lane entering the intersection, left-turns will be prohibited).

Pavement markings, signing, and traffic signal operations will be modified by the proponent to conform to the redesign of this intersection. The proponent will also coordinate/interconnect this traffic signal with the signals at the Route 20/Hosmer Street intersection and the Route 20/Post Road Shopping Center Drive intersection.

Mitigation required by the MDPW for the Indian Hill Park project will also mitigate the traffic impacts at this location from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Indian Hill Park proponent could be required to implement.

Route 20/Farm Road/Wilson Street intersection

For the 1995 No-Build scenario, weekday PM peak hour LOS for this signalized intersection will be at Level B. The 1995 Build scenario without traffic mitigation indicates that LOS for this intersection will drop to Level F during the weekday PM peak hour. With mitigation in place, the 1995 Build scenario indicates that the intersection will operate at LOS B during the weekday PM peak hour.

The proponent will redesign this intersection to incorporate the following: Eastbound (two through-lanes and an exclusive left-turn lane (minimum length = 400 feet) entering the intersection and two through-lanes tapering to one lane exiting the intersection); Westbound (two through lanes and an exclusive left-turn lane (minimum length = 400 feet) entering the intersection and two through-lanes tapering to one lane exiting the intersection); Northbound (one through-lane, an exclusive left-turn lane, and two exclusive right-turn lanes (minimum length = 300 feet) entering the intersection); and, Southbound (one through/left-turn lane and an exclusive right-turn lane (minimum length = 350 feet) entering the intersection).

Pavement markings, signing, and traffic signal operations will be modified by the proponent to conform to the redesign of this intersection. The proponent will also coordinate/interconnect this traffic signal with the signal at the Route 20/West Site Access Drive intersection.

Mitigation required by the MDPW for the Indian Hill Park project will also mitigate the traffic impacts at this location from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Indian Hill Park proponent could be required to implement.

Route 20/Hager Street/Wayside Inn Road intersection

For the 1995 No-Build scenario, weekday PM peak hour LOS fo this signalized intersection will be at Level C. The 1995 Build scenario without traffic mitigation indicates that LOS for this intersection will drop to Level F during the weekday PM peak hour. With mitigation in place, the 1991 Build scenario indicates that the intersection will operate at LOS B during the weekday PM peak hour.

The City of Marlborough has decided to take on the responsibility for implementing the necessary measures at this intersection required to mitigate the traffic impacts of the Indian Hill Park and Post Road Shopping Center projects. These mitigation measures include redesigning this intersection to incorporate the following: Eastbound (two through-lanes entering the intersection (minimum length = 200 feet) and two through-lanes tapering to one lane exiting the intersection); Westbound (two through lanes (minimum length = 200 feet) enterir the intersection and two through-lanes tapering to one lane exiting the intersection); Northbound (one lane entering the intersection); and, Southbound (one lane entering the intersection).

Pavement markings, signing, and traffic signal operations will be modified by the City of Marlborough to conform to the redesign of this intersection.

Mitigation required by the MDPW for the Indian Hill Park project will also mitigate the traffic impacts at this location from the Post Road Shopping Center development. There are no additional feasible means or measures to avoid or minimize these impacts that the Indian Hill Park proponent could be required to implement.

Route 20/Hosmer Street intersection

For the 1995 No-Build scenario, weekday PM peak hour LOS fo this signalized intersection will be at Level B. The 1995 Build

scenario without traffic mitigation indicates that LOS for this intersection will drop to Level F during the weekday PM peak hour. With mitigation in place, the 1995 Build scenario indicates that the intersection will operate at LOS C during the weekday PM peak hour.

Mitigation required by the MDPW for the Post Road Shopping Center project, as specified in the Section 61 Finding for that project dated January 3, 1990, will also mitigate the traffic impacts from the Indian Hill Park development. There are no additional feasible means or measures to avoid or minimize these impacts that the Indian Hill Park proponent could be required to implement.

Route 20/Post Road Shopping Center Drive intersection

For the 1995 No-Build scenario, weekday PM peak hour LOS for the critical vehicle movement at this unsignalized intersection (the Route 20 Eastbound left-turn) will be at Level F. The 1995 Build scenario without traffic mitigation indicates that LOS for the critical vehicle movement at this intersection will remain at Level F during the weekday PM peak hour. With mitigation in place, the 1995 Build scenario indicates that the intersection will operate at LOS D during the weekday PM peak hour.

Mitigation required by the MDPW for the Post Road Shopping Center project, as specified in the Section 61 Finding for that project dated January 3, 1990, will also mitigate the traffic impacts from the Indian Hill Park development. There are no additional feasible means or measures to avoid or minimize these impacts that the Indian Hill Park proponent could be required to implement.

Right-of-Way

The City of Marlborough through its Mayor and the project proponent shall arrange for the acquisition of the rights in real estate necessitated by the traffic mitigation for this project. The proponent shall be responsible for the costs of all property acquisition. Utility installations located on the state highway which require relocation due to the traffic mitigation for this project will be the responsibility of the utility owner.

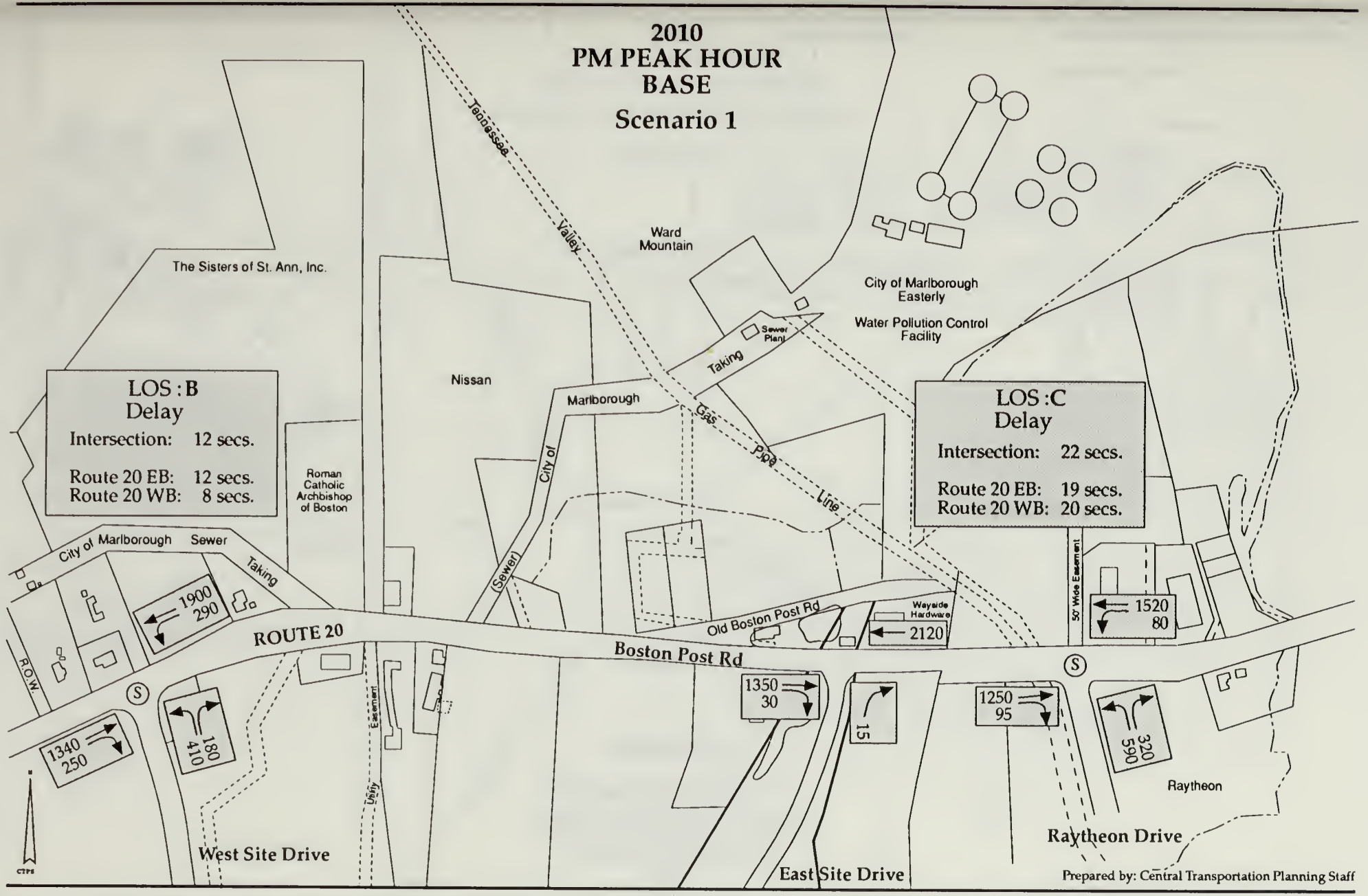
Land acquisition in conjunction with mitigation work on Route 20 will be completed as soon as possible. Land acquisition in conjunction with the construction of the Connector Road will be completed as the necessary parcels for the layout of the Connector Road become available.

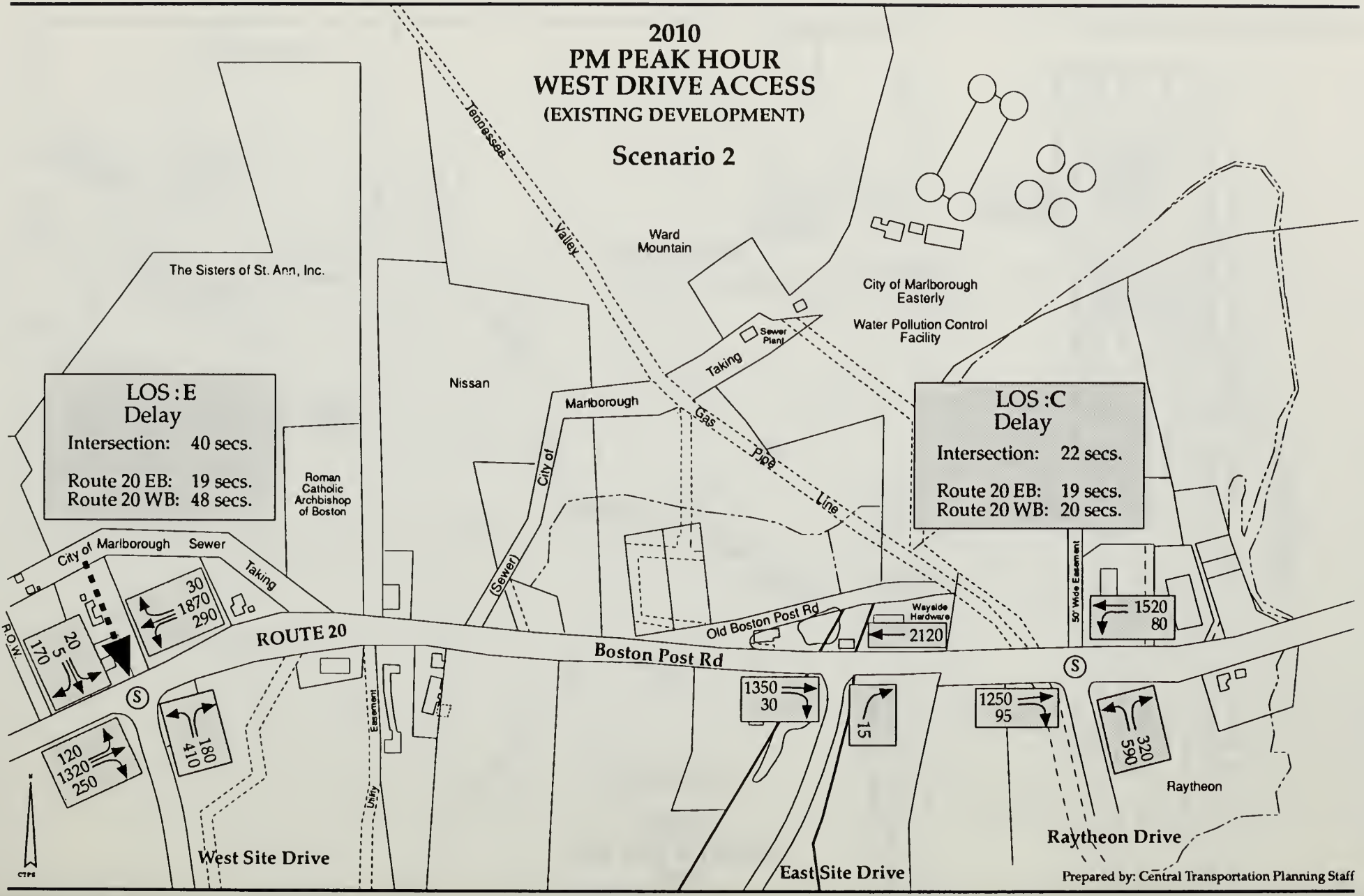
FINDINGS

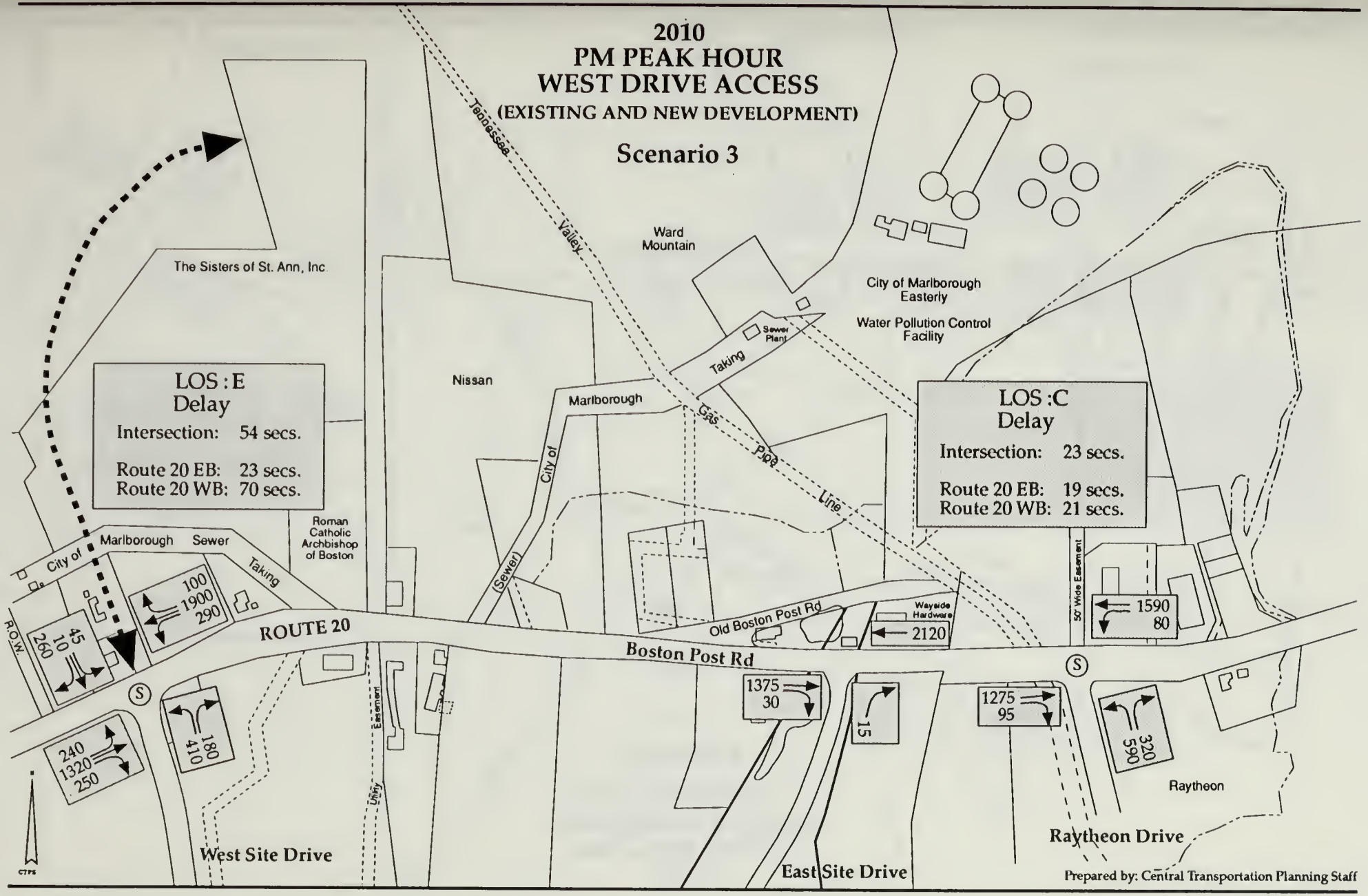
For the reasons stated above, the MDPW hereby finds that, with implementation by the Indian Hill Park proponent of the mitigation measures described above, all practicable means and measures will be taken to avoid or minimize adverse traffic and related impacts to the environment due to the Indian Hill Park project. Appropriate conditions will be included in the access and traffic signal permits to be issued by the MDPW to describe more fully and ensure implementation of said traffic mitigation measures.

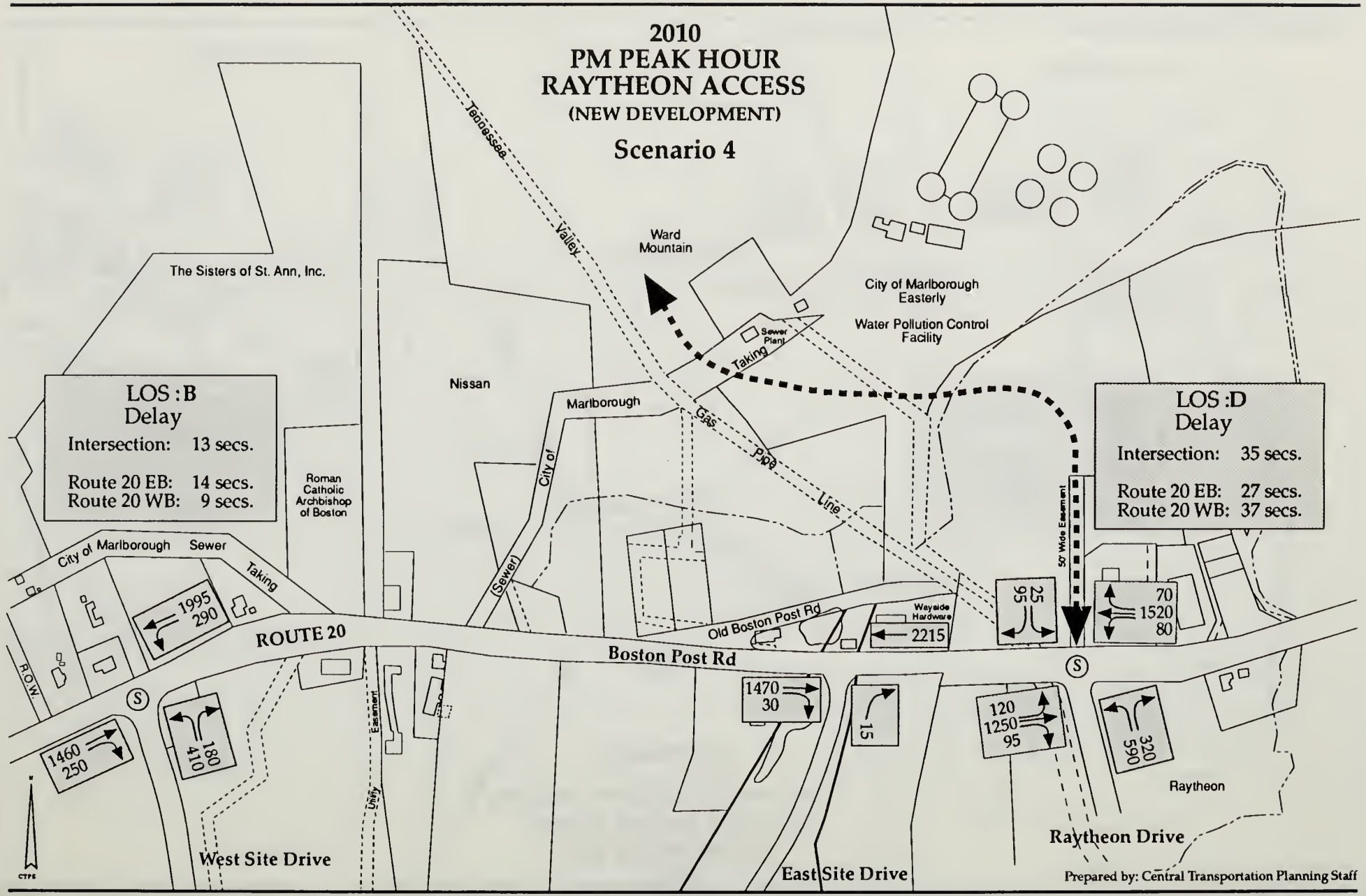
3/13/90
DATE

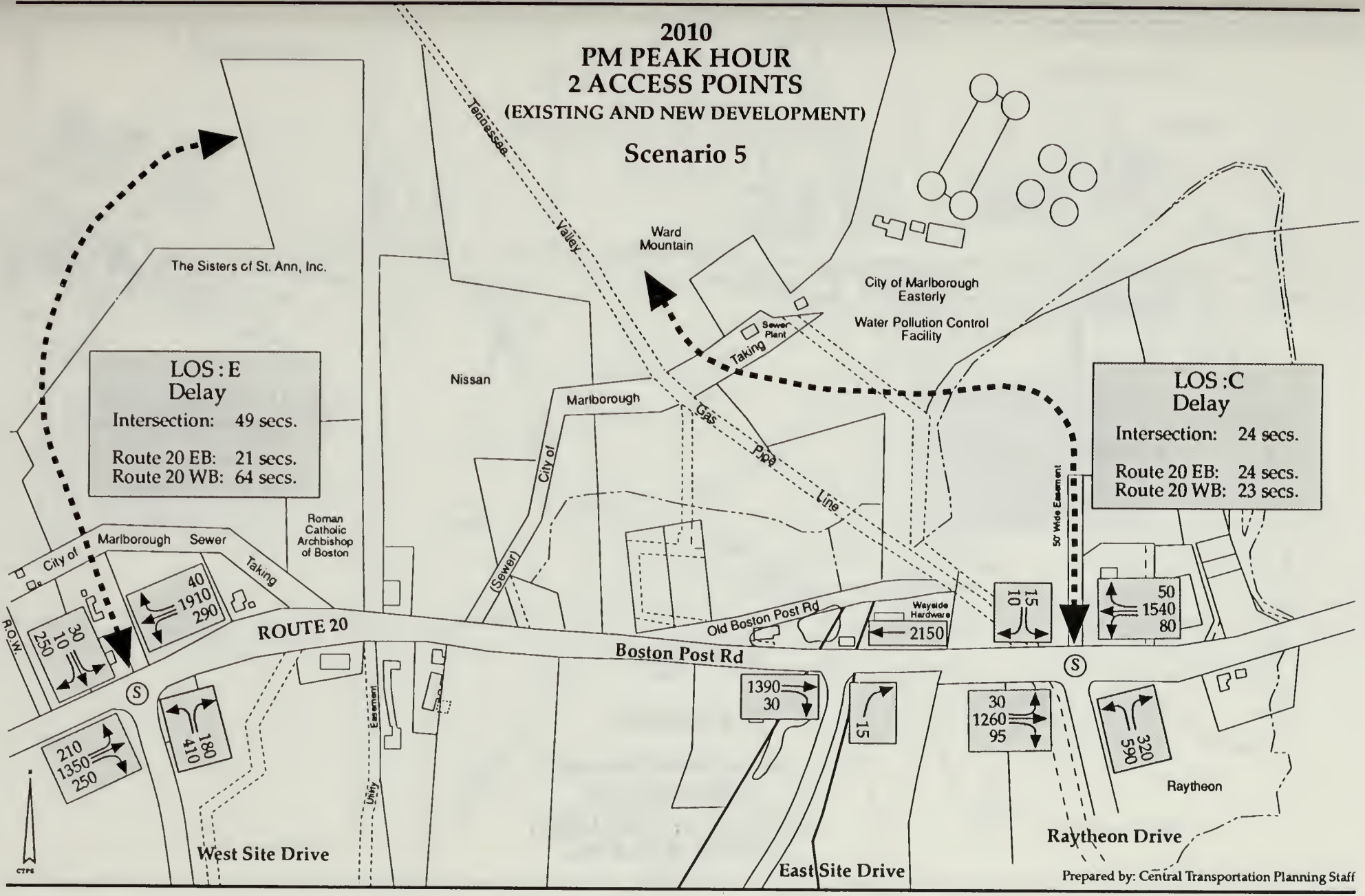
Thomas F. McLoughlin, Director
Public/Private Development Unit

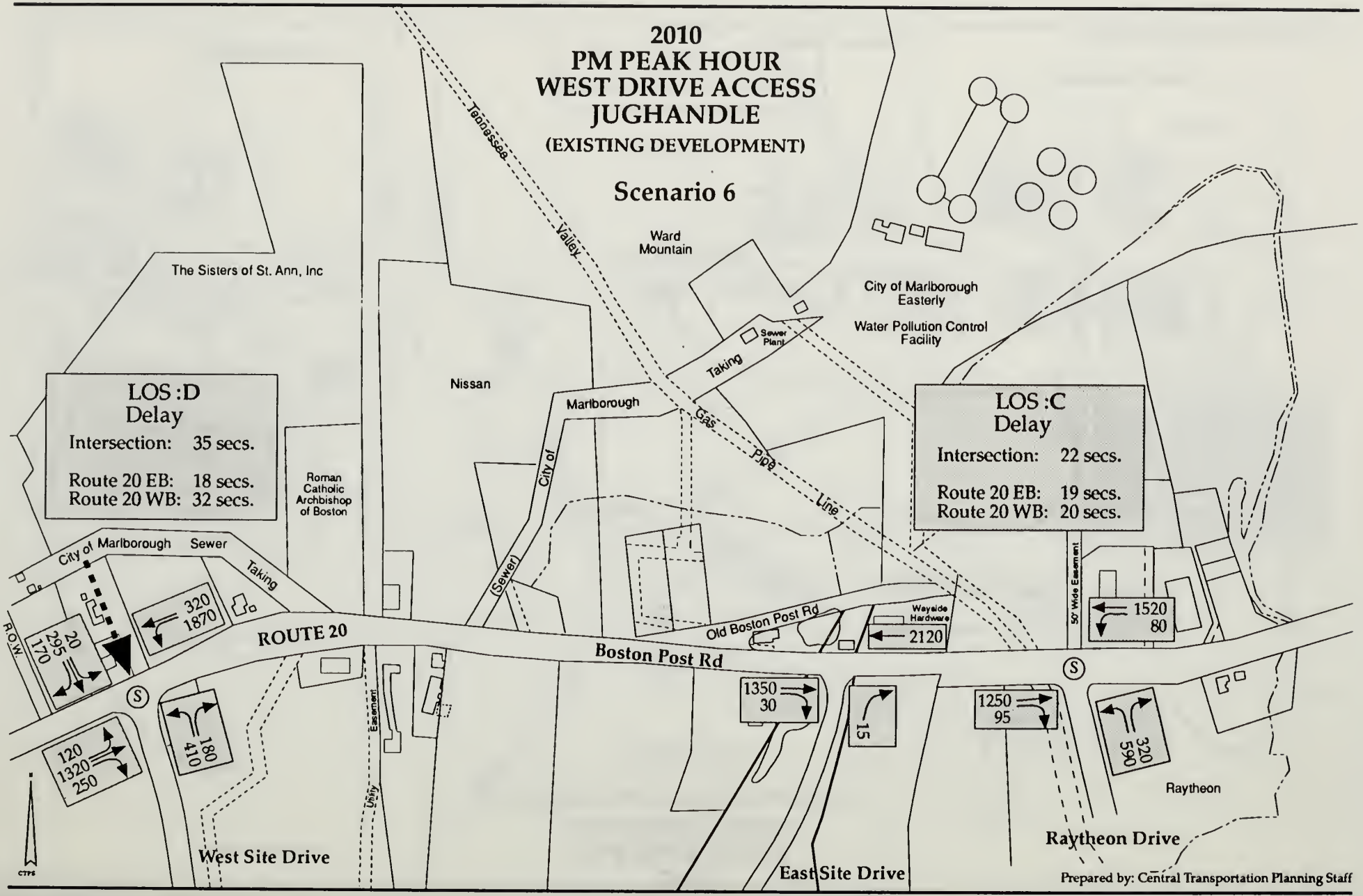

2010
PM PEAK HOUR
BASE
Scenario 1
LOS : B
Delay
Intersection: 12 secs.
Route 20 EB: 12 secs.
Route 20 WB: 8 secs.
LOS : C
Delay
Intersection: 22 secs.
Route 20 EB: 19 secs.
Route 20 WB: 20 secs.
Tennessee Valley
Ward Mountain
The Sisters of St. Ann, Inc.
City of Marlborough Easterly Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe Line
City of (Sewer)
Roman Catholic Archbishop of Boston
City of Marlborough Sewer
Taking
1900
290
ROUTE 20
Boston Post Rd
Old Boston Post Rd
Wayside Hardware
2120
50' Wide Easement
1520
80
R.O.W.
1340
250
180
410
Easement
Utility
1350
30
15
1250
95
320
590
Raytheon
West Site Drive
East Site Drive
Raytheon Drive
Prepared by: Central Transportation Planning Staff

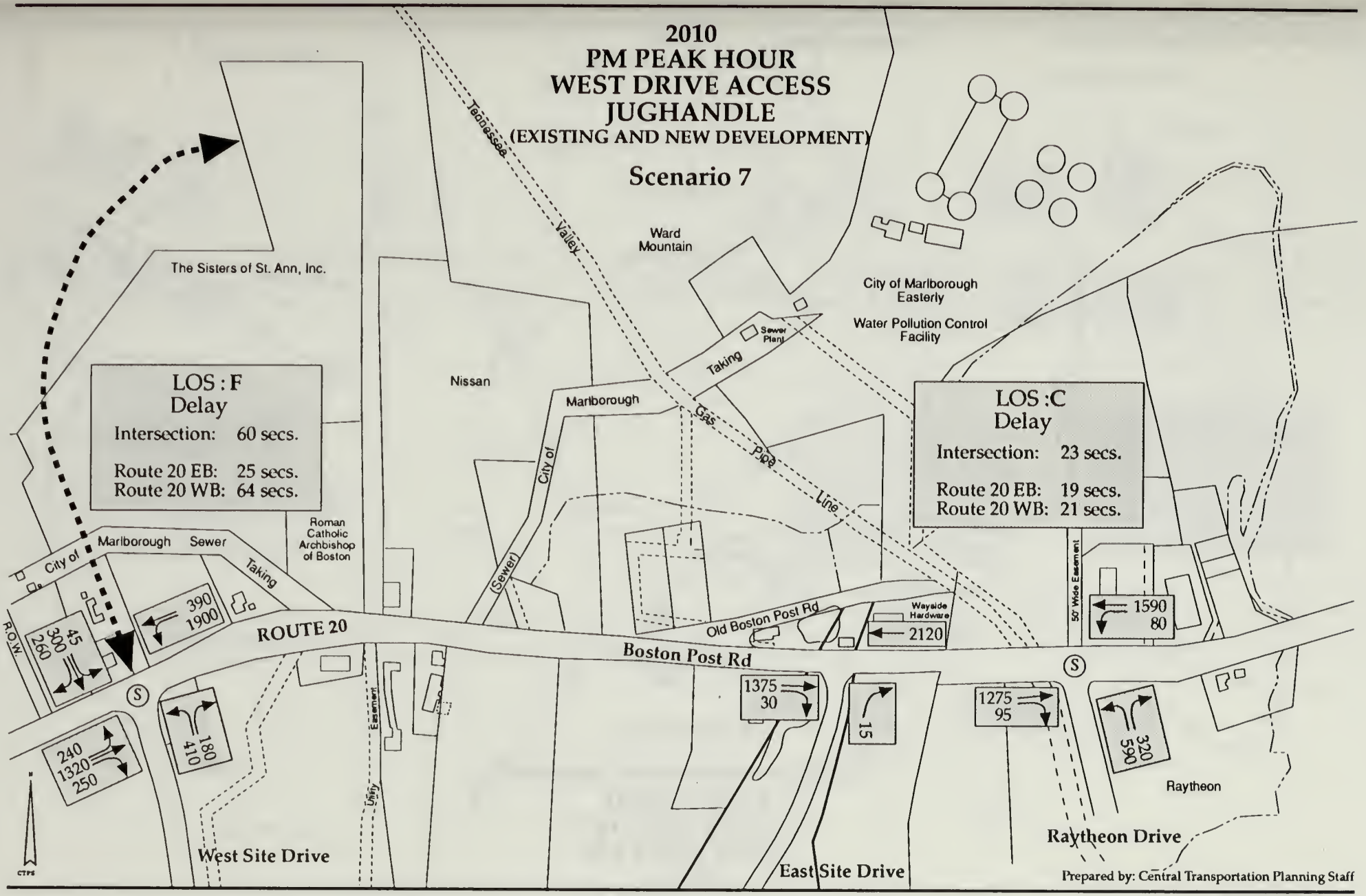

2010
PM PEAK HOUR
WEST DRIVE ACCESS
(EXISTING DEVELOPMENT)
Scenario 2
Tennessee Valley
Ward Mountain
The Sisters of St. Ann, Inc.
City of Marlborough Easterly Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe Line
City of (Sewer)
Roman Catholic Archbishop of Boston
LOS : E
Delay
Intersection: 40 secs.
Route 20 EB: 19 secs.
Route 20 WB: 48 secs.
LOS : C
Delay
Intersection: 22 secs.
Route 20 EB: 19 secs.
Route 20 WB: 20 secs.
City of Marlborough Sewer
Taking
50' Wide Easement
Old Boston Post Rd
Wayside Hardware
ROUTE 20
Boston Post Rd
R.O.W.
Unity Easement
West Site Drive
East Site Drive
Raytheon Drive
Raytheon
Prepared by: Central Transportation Planning Staff

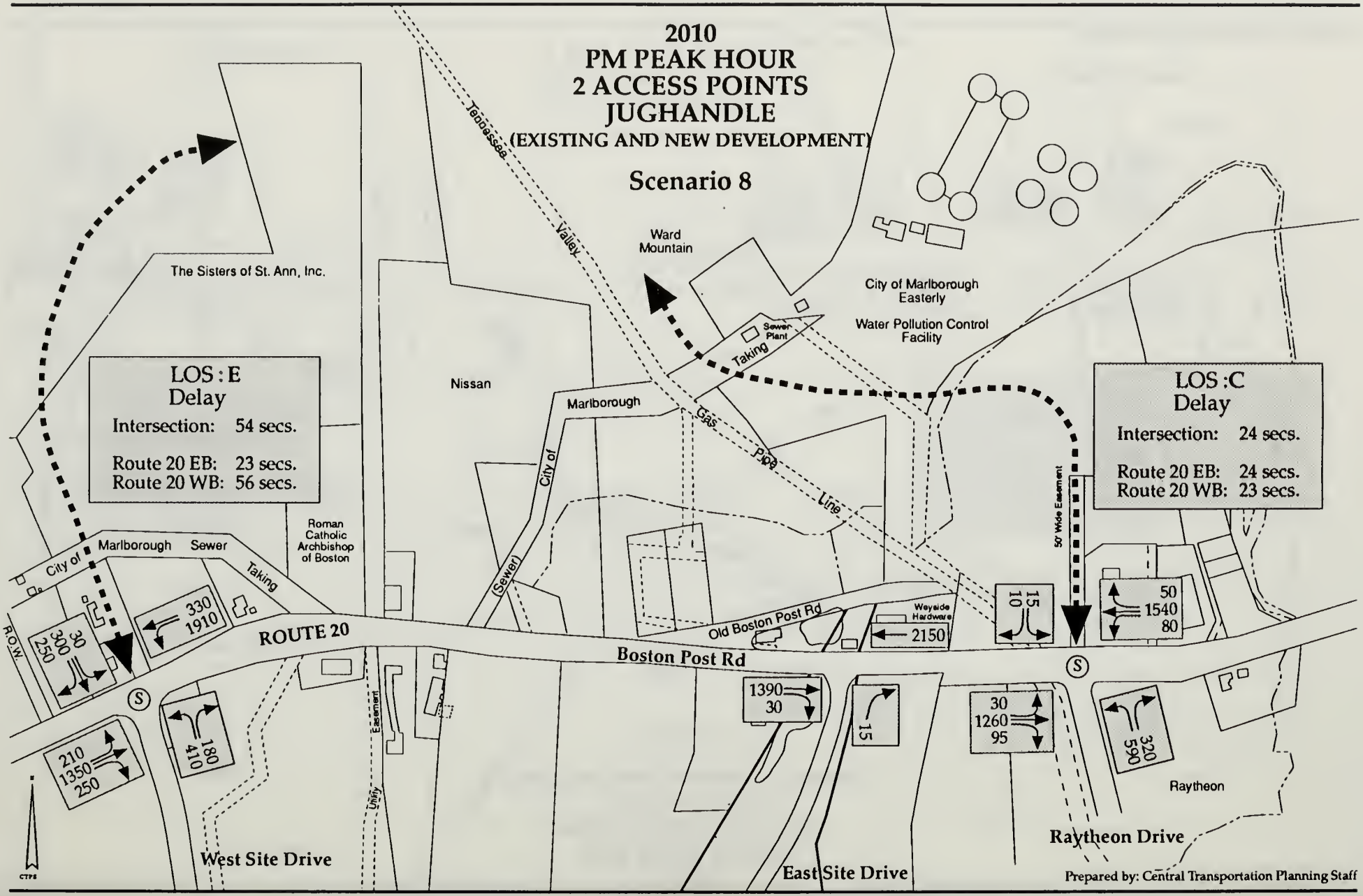

2010
PM PEAK HOUR
WEST DRIVE ACCESS
(EXISTING AND NEW DEVELOPMENT)
Scenario 3
The Sisters of St. Ann, Inc.
Ward Mountain
Jeanesse
Valley
City of Marlborough Easterly Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe Line
City of
(Sewer)
LOS : E
Delay
Intersection: 54 secs.
Route 20 EB: 23 secs.
Route 20 WB: 70 secs.
LOS : C
Delay
Intersection: 23 secs.
Route 20 EB: 19 secs.
Route 20 WB: 21 secs.
Roman Catholic Archbishop of Boston
City of Marlborough Sewer
Taking
R.O.W.
ROUTE 20
Boston Post Rd
Old Boston Post Rd
Wayside Hardware
50' Wide Easement
100
1900
290
45
10
260
2120
1590
80
1375
30
15
1275
95
320
590
240
1320
250
180
410
Utility Easement
Raytheon
Raytheon Drive
West Site Drive
East Site Drive
Prepared by: Central Transportation Planning Staff

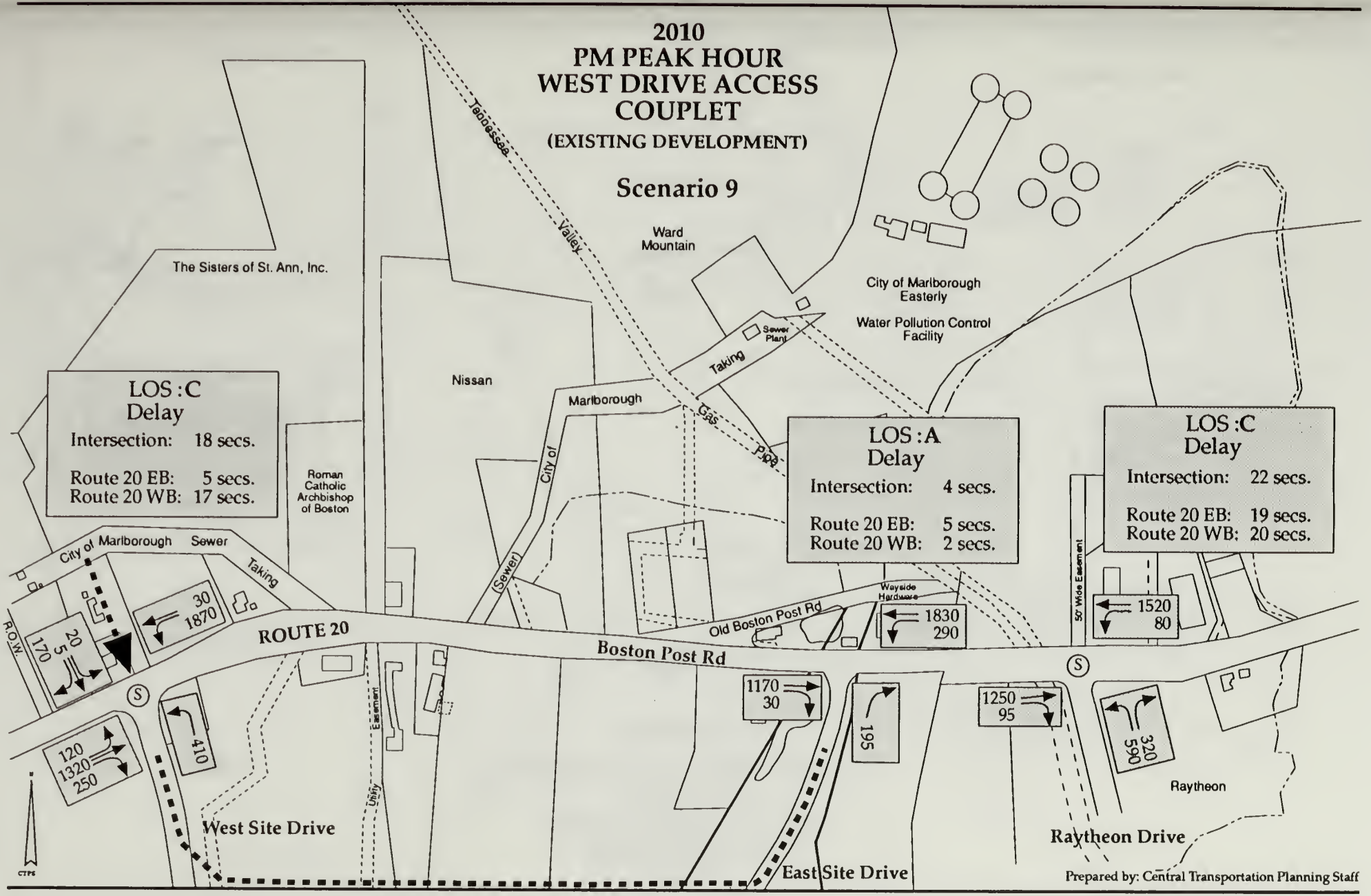

2010
PM PEAK HOUR
RAYTHEON ACCESS
(NEW DEVELOPMENT)
Scenario 4
Tennessee Valley
Ward Mountain
The Sisters of St. Ann, Inc.
City of Marlborough Easterly Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe Line
City of (Sewer)
Roman Catholic Archbishop of Boston
LOS :B
Delay
Intersection: 13 secs.
Route 20 EB: 14 secs.
Route 20 WB: 9 secs.
LOS :D
Delay
Intersection: 35 secs.
Route 20 EB: 27 secs.
Route 20 WB: 37 secs.
50' Wide Easement
City of Marlborough Sewer
Taking
ROUTE 20
Boston Post Rd
Old Boston Post Rd
Wayside Hardware
R.O.W.
Unity Easement
1995
290
2215
25
95
70
1520
80
1460
250
180
410
1470
30
15
120
1250
95
320
590
Raytheon
Raytheon Drive
West Site Drive
East Site Drive
Prepared by: Central Transportation Planning Staff

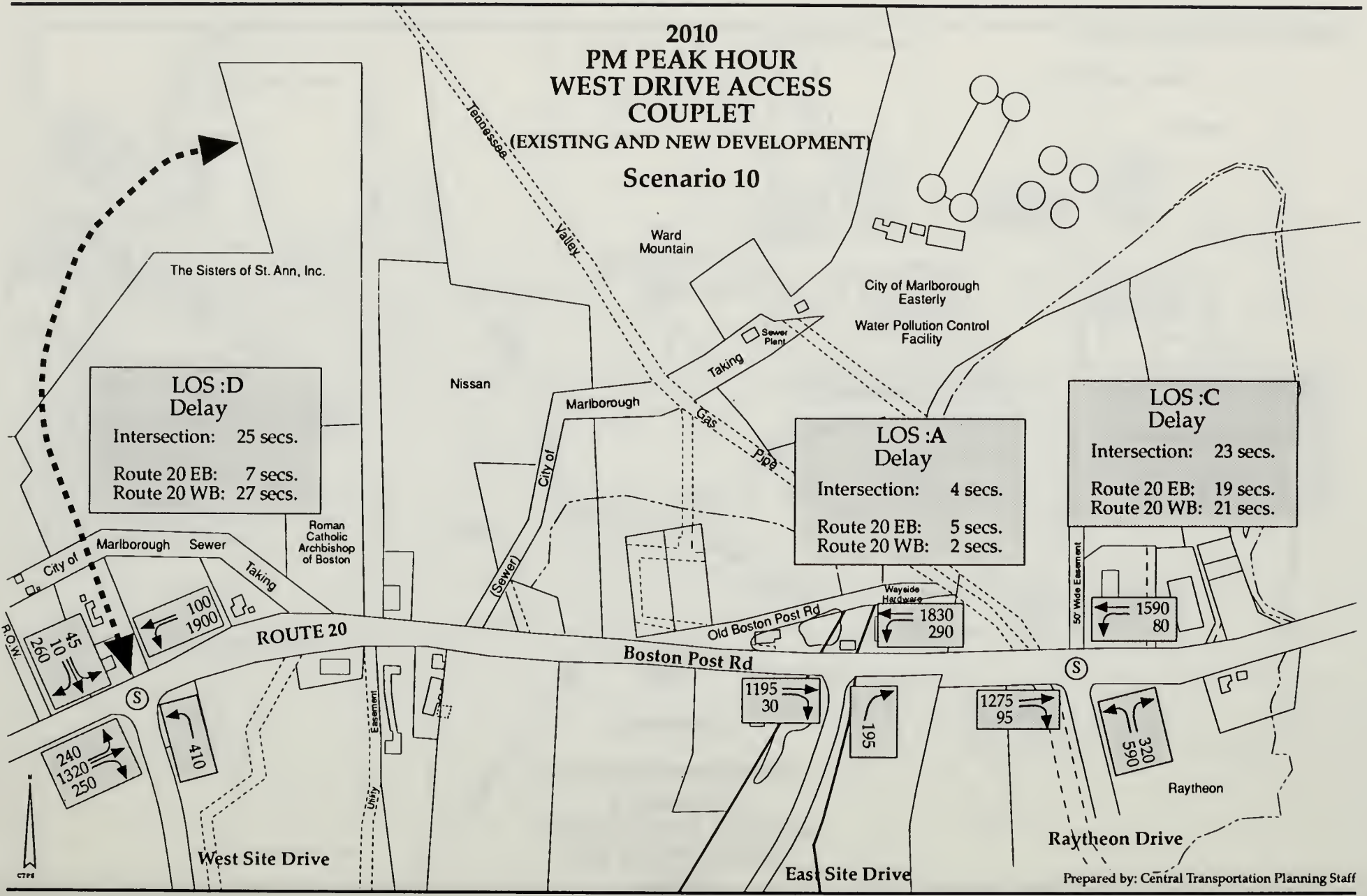

2010
PM PEAK HOUR
2 ACCESS POINTS
(EXISTING AND NEW DEVELOPMENT)
Scenario 5
The Sisters of St. Ann, Inc.
Tennessee Valley
Ward Mountain
City of Marlborough Easterly Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe Line
City of (Sewer)
50' Wide Easement
LOS : E
Delay
Intersection: 49 secs.
Route 20 EB: 21 secs.
Route 20 WB: 64 secs.
LOS : C
Delay
Intersection: 24 secs.
Route 20 EB: 24 secs.
Route 20 WB: 23 secs.
Roman Catholic Archbishop of Boston
City of Marlborough Sewer Taking
ROUTE 20
Boston Post Rd
Old Boston Post Rd
Wayside Hardware
R.O.W.
Unity Easement
West Site Drive
East Site Drive
Raytheon Drive
Raytheon
CTPS
Prepared by: Central Transportation Planning Staff

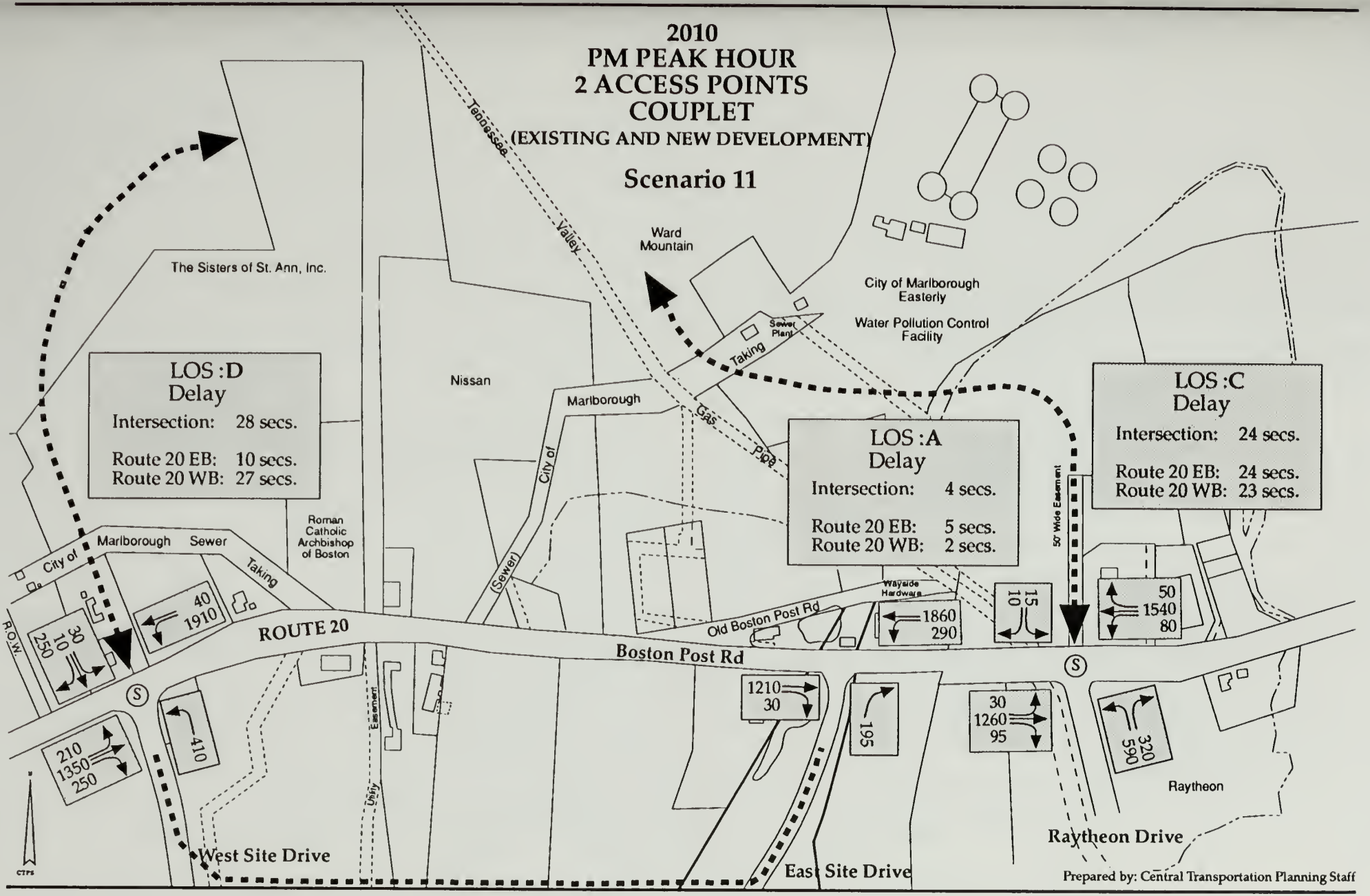

2010
PM PEAK HOUR
WEST DRIVE ACCESS
JUGHANDLE
(EXISTING DEVELOPMENT)
Scenario 6
Tennessee Valley
Ward Mountain
The Sisters of St. Ann, Inc
City of Marlborough Easterly Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe Line
City of (Sewer)
Roman Catholic Archbishop of Boston
LOS :D
Delay
Intersection: 35 secs.
Route 20 EB: 18 secs.
Route 20 WB: 32 secs.
LOS :C
Delay
Intersection: 22 secs.
Route 20 EB: 19 secs.
Route 20 WB: 20 secs.
City of Marlborough Sewer
Taking
R.O.W.
ROUTE 20
Boston Post Rd
Old Boston Post Rd
Wayside Hardware
50' Wide Easement
Easement
Utility
320
1870
20
295
170
180
410
120
1320
250
1350
30
15
1250
95
320
590
1520
80
2120
West Site Drive
East Site Drive
Raytheon
Raytheon Drive
CTPS
Prepared by: Central Transportation Planning Staff


2010
PM PEAK HOUR
WEST DRIVE ACCESS
JUGHANDLE
(EXISTING AND NEW DEVELOPMENT)
Scenario 7
The Sisters of St. Ann, Inc.
Tennessee Valley
Ward Mountain
City of Marlborough Easterly Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe Line
City of (Sewer)
LOS : F
Delay
Intersection: 60 secs.
Route 20 EB: 25 secs.
Route 20 WB: 64 secs.
LOS :C
Delay
Intersection: 23 secs.
Route 20 EB: 19 secs.
Route 20 WB: 21 secs.
Roman Catholic Archbishop of Boston
City of Marlborough Sewer Taking
50' Wide Easement
Old Boston Post Rd
Wayside Hardware
2120
390
1900
45
300
260
ROUTE 20
Boston Post Rd
R.O.W
1590
80
1375
30
15
1275
95
320
590
240
1320
250
180
410
Utility Easement
Raytheon
West Site Drive
East Site Drive
Raytheon Drive
CTPS
Prepared by: Central Transportation Planning Staff


2010
PM PEAK HOUR
2 ACCESS POINTS
JUGHANDLE
(EXISTING AND NEW DEVELOPMENT)
Scenario 8
Tennessee Valley
Ward Mountain
The Sisters of St. Ann, Inc.
City of Marlborough Easterly Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe Line
City of (Sewer)
LOS : E
Delay
Intersection: 54 secs.
Route 20 EB: 23 secs.
Route 20 WB: 56 secs.
LOS :C
Delay
Intersection: 24 secs.
Route 20 EB: 24 secs.
Route 20 WB: 23 secs.
50' Wide Easement
Roman Catholic Archbishop of Boston
City of Marlborough Sewer Taking
ROUTE 20
Boston Post Rd
Old Boston Post Rd
Wayside Hardware
R.O.W.
Easement
Utility
West Site Drive
East Site Drive
Raytheon Drive
Raytheon
Prepared by: Central Transportation Planning Staff
CTPS


2010
PM PEAK HOUR
WEST DRIVE ACCESS
COUPLET
(EXISTING DEVELOPMENT)
Scenario 9
Tennessee
Valley
Ward
Mountain
The Sisters of St. Ann, Inc.
City of Marlborough
Easterly
Water Pollution Control
Facility
Sewer
Plant
Taking
Nissan
Marlborough
Gas
Pipe
City of
(Sewer)
Roman
Catholic
Archbishop
of Boston
LOS :C
Delay
Intersection: 18 secs.
Route 20 EB: 5 secs.
Route 20 WB: 17 secs.
LOS :A
Delay
Intersection: 4 secs.
Route 20 EB: 5 secs.
Route 20 WB: 2 secs.
LOS :C
Delay
Intersection: 22 secs.
Route 20 EB: 19 secs.
Route 20 WB: 20 secs.
City of Marlborough Sewer
Taking
R.O.W.
ROUTE 20
Boston Post Rd
Old Boston Post Rd
Wayside
Hardware
50' Wide Easement
Easement
Utility
West Site Drive
East Site Drive
Raytheon
Raytheon Drive
30
1870
20
5
170
1830
290
1520
80
1170
30
195
1250
95
320
590
120
1320
250
410
Prepared by: Central Transportation Planning Staff


2010
PM PEAK HOUR
WEST DRIVE ACCESS
COUPLET
(EXISTING AND NEW DEVELOPMENT)
Scenario 10
The Sisters of St. Ann, Inc.
Tennessee Valley
Ward Mountain
City of Marlborough Easterly
Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe
City of (Sewer)
LOS :D
Delay
Intersection: 25 secs.
Route 20 EB: 7 secs.
Route 20 WB: 27 secs.
LOS :A
Delay
Intersection: 4 secs.
Route 20 EB: 5 secs.
Route 20 WB: 2 secs.
LOS :C
Delay
Intersection: 23 secs.
Route 20 EB: 19 secs.
Route 20 WB: 21 secs.
Roman Catholic Archbishop of Boston
City of Marlborough Sewer
Taking
R.O.W.
ROUTE 20
Boston Post Rd
Old Boston Post Rd
Wayside Hardware
50' Wide Easement
Easement
Utility
West Site Drive
East Site Drive
Raytheon Drive
Raytheon
Prepared by: Central Transportation Planning Staff
100
1900
45
10
260
240
1320
250
410
1830
290
1590
80
1195
30
195
1275
95
320
590


2010
PM PEAK HOUR
2 ACCESS POINTS
COUPLET
(EXISTING AND NEW DEVELOPMENT)
Scenario 11
The Sisters of St. Ann, Inc.
Tennessee Valley
Ward Mountain
City of Marlborough Easterly Water Pollution Control Facility
Sewer Plant
Taking
Nissan
Marlborough
Gas Pipe
City of (Sewer)
LOS :D
Delay
Intersection: 28 secs.
Route 20 EB: 10 secs.
Route 20 WB: 27 secs.
LOS :A
Delay
Intersection: 4 secs.
Route 20 EB: 5 secs.
Route 20 WB: 2 secs.
LOS :C
Delay
Intersection: 24 secs.
Route 20 EB: 24 secs.
Route 20 WB: 23 secs.
50' Wide Easement
Roman Catholic Archbishop of Boston
City of Marlborough Sewer Taking
Wayside Hardware
Old Boston Post Rd
ROUTE 20
Boston Post Rd
R.O.W.
Easement
Unity
West Site Drive
East Site Drive
Raytheon Drive
Raytheon
Prepared by: Central Transportation Planning Staff
CTPS

Appendix F

1995 and 2010 Commercial and Residential Developments in the Study Area Towns

1987, 1995 and 2010 Socioeconomic Characteristics of Traffic Zones in Study Area Towns

Route 20 Study Area
Traffic Zone System

Commercial Developments Included in 1995 Forecasts

COMMUNITY	ZONE	DEVELOPMENT	LANDUSE TYPE*	SQ. Ft./ ROOMS	EMPLOYEES RETAIL	EMPLOYEES N-RETAIL
MARLBOROUGH	47	Kay	I	375000		709
	50	Ames Street	Hotel	325	293	
	50	Ames Street	Ret	175000	298	
	123	Mar Bus C11	I	77000		146
	123	Mar Bus C4	I	83000		157
	128	Bronx Park	O	170000		749
	128	Hampton	Hotel	150	135	
	128	Quality Inn	Hotel	100	90	
	131	Met Life 10	I	71000		134
	131	Met Life 9	O	93000		447
	131	Met Life 8	O	84000		404
	131	Met life 7	O	75000		364
	131	Met Life 4	O	85000		407
	131	Bartlett	O	220000		775
	131	Bartlett	I	220000		416
	131	Hayes Memorial 1	O/R&D	500000		1101
	131	Hayes Memorial 2,3,4	O/R&D	1500000		3303
	133	Crane Meadow	O	850000		2993
	134	Digital	O	400000		1399
	134	Digital	O	350000		1224
	134	495 Tech	I	640000		1210
	134	3 Westec Realty Trust	I	200000		378
	135	Nordblum	I	999000		1888
	137	Elm Street	I	70000		132
	140	Techboro	I	200000		378
	154	Post Road	Ret	100000	170	
	169	Shoppes at Marlboro	Ret	55000	94	
	169	Fafard/Indian Hill	Ret	110000	187	
	171	Raytheon	O	250000		1727
	171	Raytheon	I	250000		473
TOTAL					1267	20914
SUDBURY	54	Dental Arts Building	O	6000		29
	54	Country Living	Ret	6000	10	
	54	Sperry Parcel	O	75000		361
	178	Peakham	O	1040		5
	183	Chiswick Trading	Thea	11450		17
	183	Chiswick Trading	I	84000		185
TOTAL					10	597
WAYLAND	202	Main Street	O	45000		216
TOTAL						216

Commercial Developments Included in 1995 Forecasts (cont.)

MUNITY	ZONE	DEVELOPMENT	LANDUSE TYPE*	SQ. Ft./ ROOMS	EMPLOYEES RETAIL	N-RETAIL
T	204	133 Boston Post Road	O	100000		481
	204	Mass Brokenstone	O	350000		1724
A					0	2205

nstrial
= tail
f ce
= search and Development
a heater

Housing Developments Included in 1995 Forecasts

COMMUNITY	ZONE	DEVELOPMENT	LANDUSE TYPE	UNITS
MARLBOROUGH	47	Addition Hill	R	580
	53	Pine Hill	R	22
	152	Goodale Farms	R	51
	124	Wildwood Acres	R	18
	128	Daley Condos	R	84
	131	Hayes Estates	R	65
	145	Shoestring Hill	R	24
	145	Barberry Estates	R	80
	145	Stratton Woods	R	50
	145	Jerico Hill Estates	R	61
	152	Shefford Village	R	65
	152	Forest Meadows	R	17
	159	Orchard Estates, Stow	R	43
	159	Orchard Estates, Hosmer	R	17
	159	Mello Lane Estates	R	55
	161	Wilson Terrace	R	17
	169	Indian Hill	R	348
TOTAL				1597
SUDBURY	54	Libery Hill Estates	R	79
	54	Estrel Ridge	R	9
	54	Willis Hill	R	34
	54	Cranberry Meadows	R	37
	56	Pheasant Meadow	R	18
	56	Atkinson Farms	R	48
	56	Peakham Pines	R	4
	56	Algonquin Oaks	R	9
	56	Pratt's Mill	R	6
	57	Borden Hill Lane	R	2
	57	Walker Farm	R	7
	57	Kato Drive & Summit	R	17
	59	Evergreen Meadow	R	3
	173	Twin Meadow	R	3
	173	Ruddok Road	R	10
	175	Estates	R	5
	176	Tall Pines	R	25
	179	Twin Pond	R	7
	179	Meadow View Knoll	R	5
	172	Westway	R	31
TOTAL				359
WAYLAND	61	Watertown Dairy	R	6

Housing Developments Included in 1995 Forecasts (cont.)

MUNITY	ZONE	DEVELOPMENT	LANDUSE TYPE	UNITS
	62	Mainstone 2-3	R	127
	62	Mainstone 4-5	R	279
	63	Willow Brook	R	44
	189	James Estates	R	17
	189	Tall Pines	R	10
	191	Plain Road Estate	R	13
	202	Griffin Circle	R	9
TA				505
S'N	208	Winter Street Apts	R	90
TA				90

Employee Density by Type of Development

Type of Development	Number of Employees
General Office	
<100,000 s.f.	1 employee per 208 s.f.
100,000-199,999 s.f.	1 employee per 227 s.f.
>200,000 s.f.	1 employee per 286 s.f.
Research Center	1 employee per 454 s.f.
Medical Office Bldg.	1 employee per 277.7 s.f.
Mini-Warehouse	2 employees per mini-warehouse
Warehousing	1 employee per 769 s.f.
Manufacturing	1 employee per 543.5 s.f.
Industrial Park	1 employee per 529 s.f.
Heavy Industrial	1 employee per 625 s.f.
Light Industrial	1 employee per 435 s.f.
New Car Sale	1 employee per 504 s.f.
Hotel	0.9 employee per room
Motel	0.4 employee per room
Retail	1 employee per 588 s.f.

*ITE Trip Generation Manual

1987 Socioeconomic Characteristics

	ZONE	# OF HH	1980 INCOME	EMPLOYMENT RETAIL	EMPLOYMENT N-RETAIL
ARLBOROUGH	47	260	19891	35	1615
	49	465	25000	0	75
	50	290	27150	0	225
	51	260	17670	0	55
	52	344	17022	0	50
	53	290	19000	20	0
	123	25	27150	0	950
	124	86	27150	0	35
	125	295	27150	0	0
	126	85	27150	0	109
	127	210	27150	0	1030
	128	85	27150	80	1822
	129	185	27150	44	115
	130	0	27150	0	300
	131	0	27150	30	1254
	132	0	27150	15	401
	133	5	27150	0	612
	134	0	27150	0	1035
	135	385	19891	0	175
	136	240	19891	0	200
	137	259	19891	174	225
	138	496	19891	0	650
	139	495	19891	0	113
	140	0	17670	0	150
	141	275	17670	45	30
	142	198	17670	25	119
	143	185	17670	40	0
	144	69	17670	0	270
	145	189	17670	109	255
	146	330	17670	105	20
	147	98	17670	5	10
	148	0	17678	153	379
	149	64	17670	75	120
	151	469	17670	155	805
	152	896	25000	80	350
	153	585	25000	0	0
	154	80	25000	105	205
	155	260	17022	140	40
	156	225	17022	40	50
	157	45	17022	0	0
	158	890	17022	165	1035
	159	657	25000	0	25
	160	5	25000	25	0
	161	370	25000	0	0
	162	85	25000	88	132
	163	85	25000	105	25

1987 Socioeconomic Characteristics (cont.)

	ZONE	# OF HH	1980 INCOME	EMPLOYMENT RETAIL	N-RETAIL
	164	185	25000	70	60
	165	0	25000	35	245
	166	349	17022	30	25
	167	173	17022	40	25
	168	219	19000	15	25
	169	0	19000	115	75
	171	0	19000	6	5
TOTAL		11746		2169	15526
SUDBURY	54	805	41700	44	370
	56	987	38725	0	340
	57	85	36272	120	210
	58	355	42794	195	675
	59	315	38360	0	360
	173	525	41700	0	95
	175	210	41700	0	568
	176	250	38725	0	150
	178	75	36272	100	975
	179	275	36272	0	260
	180	60	36272	200	133
	181	10	36272	260	660
	182	110	42794	200	110
	183	25	42794	75	2107
	184	35	42794	160	120
	185	145	42794	65	110
	186	0	38360	275	400
	187	45	38360	197	110
	188	250	38360	0	145
TOTAL		4562		1891	7898
WAYLAND	60	135	44215	0	0
	61	290	45090	50	70
	62	385	43376	0	0
	63	445	28289	302	42
	189	289	44215	0	0
	190	342	45090	0	0
	191	135	45090	0	0
	193	26	45090	65	385
	194	0	45090	185	1118
	195	0	45090	193	25
	196	85	45090	0	120
	197	286	43376	0	0
	198	225	43376	190	90
	199	295	43376	45	120

1987 Socioeconomic Characteristics (cont.)

	ZONE	# OF HH	1980 INCOME	EMPLOYMENT RETAIL	N-RETAIL
	200	136	43376	165	65
	201	850	28289	0	10
	202	282	28289	0	40
TAL		4206		1195	2085
STON	64	492	42855	5	50
	65	441	44077	0	220
	66	363	51421	60	950
	67	602	52233	68	250
	68	280	54501	0	530
	203	271	44077	0	0
	204	275	51421	250	400
	205	250	52233	30	239
	206	360	52233	0	300
	207	196	51421	0	200
	208	170	54501	0	50
	209	360	54501	0	0
TAL		4060		413	3189

1995 Socioeconomic Characteristics

	ZONE	# OF HH	1980 INCOME	EMPLOYMENT RETAIL	EMPLOYMENT N-RETAIL
MARLBOROUGH	47	260	19891	35	1969
	49	465	25000	0	75
	50	290	27150	591	225
	51	260	17670	0	55
	52	344	17022	0	50
	53	290	19000	20	0
	123	25	27150	0	1253
	124	104	27150	0	35
	125	295	27150	0	0
	126	85	27150	0	109
	127	210	27150	0	1030
	128	169	27150	80	1822
	129	185	27150	44	115
	130	0	27150	0	300
	131	65	27150	30	3605
	132	0	27150	15	401
	133	5	27150	0	1598
	134	0	27150	0	3076
	135	385	19891	0	175
	136	240	19891	0	200
	137	259	19891	174	357
	138	496	19891	0	650
	139	495	19891	0	113
	140	0	17670	0	150
	141	275	17670	45	30
	142	198	17670	25	119
	143	185	17670	40	0
	144	69	17670	0	270
	145	404	17670	109	255
	146	330	17670	105	20
	147	98	17670	5	10
	148	0	17678	153	379
	149	64	17670	75	120
	151	469	17670	155	805
	152	978	25000	80	350
	153	585	25000	0	0
	154	80	25000	105	205
	155	260	17022	140	40
	156	225	17022	40	50
	157	45	17022	0	0
	158	890	17022	165	1035
	159	772	25000	0	25
	160	5	25000	25	0
	161	387	25000	0	0
	162	85	25000	88	132
	163	85	25000	105	25

1995 Socioeconomic Characteristics (cont.)

	ZONE	# OF HH	1980 INCOME	EMPLOYMENT RETAIL	N-RETAIL
	164	185	25000	70	60
	165	175	25000	35	245
	166	349	17022	30	25
	167	173	17022	40	25
	168	219	19000	15	25
	169	432	19000	551	75
	171	0	19000	6	2200
TOTAL		12949		3196	23888
SUDBURY	54	964	41700	47	774
	56	1072	38725	0	360
	57	111	36272	128	222
	58	355	42794	207	715
	59	318	38360	0	381
	173	538	41700	0	101
	175	215	41700	0	602
	176	275	38725	0	159
	178	75	36272	106	1038
	179	287	36272	0	275
	180	60	36272	213	141
	181	10	36272	276	699
	182	141	42794	213	117
	183	25	42794	80	2446
	184	35	42794	170	127
	185	145	42794	69	117
	186	0	38360	292	424
	187	45	38360	210	117
	188	250	38360	0	154
TOTAL		4921		2011	8969
WAYLAND	60	135	44215	0	0
	61	290	45090	50	71
	62	512	43376	0	0
	63	445	28289	302	42
	189	316	44215	0	0
	190	342	45090	0	0
	191	148	45090	0	0
	193	26	45090	65	385
	194	0	45090	185	1118
	195	0	45090	193	25
	196	85	45090	0	120
	197	286	43376	0	0
	198	225	43376	190	90
	199	295	43376	45	120
	200	136	43376	165	65
	201	850	28289	0	10

1995 Socioeconomic Characteristics (cont.)

	ZONE	# OF HH	1980 INCOME	EMPLOYMENT RETAIL	EMPLOYMENT N-RETAIL
	202	291	28289	0	79
TOTAL		4382		1195	2125
WESTON	64	492	42855	5	50
	65	441	44077	0	220
	66	363	51421	60	950
	67	602	52233	68	250
	68	280	54501	0	530
	203	271	44077	0	0
	204	275	51421	250	718
	205	250	52233	30	1463
	206	360	52233	0	300
	207	196	51421	0	200
	208	260	54501	0	50
	209	360	54501	0	0
TOTAL		4150		413	4731

2010 Socioeconomic Characteristics

	ZONE	# OF HH	1980 INCOME	EMPLOYMENT RETAIL	EMPLOYMENT N-RETAIL
ARLBOROUGH	47	840	19891	35	2324
	49	465	25000	0	75
	50	290	27150	591	225
	51	260	17670	0	55
	52	344	17022	0	50
	53	312	19000	20	0
	123	25	27150	0	1253
	124	104	27150	0	35
	125	295	27150	0	0
	126	85	27150	0	109
	127	210	27150	0	1030
	128	169	27150	305	2571
	129	185	27150	44	115
	130	0	27150	0	300
	131	65	27150	30	8605
	132	0	27150	15	401
	133	5	27150	0	1598
	134	0	27150	0	5624
	135	385	19891	0	2063
	136	240	19891	0	200
	137	259	19891	174	357
	138	496	19891	0	650
	139	495	19891	0	113
	140	0	17670	0	528
	141	275	17670	45	30
	142	198	17670	25	119
	143	185	17670	40	0
	144	69	17670	0	270
	145	404	17670	109	255
	146	330	17670	105	20
	147	98	17670	5	10
	148	0	17678	153	379
	149	64	17670	75	120
	151	469	17670	155	805
	152	1029	25000	80	350
	153	585	25000	0	0
	154	80	25000	275	205
	155	260	17022	140	40
	156	225	17022	40	50
	157	45	17022	0	0
	158	890	17022	165	1035
	159	772	25000	0	25
	160	5	25000	25	0
	161	387	25000	0	0
	162	85	25000	88	132
	163	85	25000	105	25

2010 Socioeconomic Characteristics (cont.)

	ZONE	# OF HH	1980 INCOME	EMPLOYMENT RETAIL	N-RETAIL
	164	185	25000	70	60
	165	175	25000	35	245
	166	349	17022	30	25
	167	173	17022	40	25
	168	219	19000	15	25
	169	432	19000	832	75
	171	0	19000	6	2200
TOTAL		13602		3872	34806
SUDBURY	54	964	41700	51	1176
	56	1072	38725	0	379
	57	111	36272	140	234
	58	355	42794	226	753
	59	318	38360	0	401
	173	538	41700	0	106
	175	215	41700	0	634
	176	275	38725	0	167
	178	75	36272	116	1093
	179	287	36272	0	289
	180	60	36272	233	148
	181	10	36272	302	736
	182	141	42794	233	123
	183	25	42794	87	2575
	184	35	42794	186	134
	185	145	42794	75	123
	186	0	38360	319	446
	187	45	38360	230	123
	188	250	38360	0	162
TOTAL		4921		2198	9802
WAYLAND	60	135	44215	0	0
	61	296	45090	50	71
	62	791	43376	0	0
	63	489	28289	302	42
	189	316	44215	0	0
	190	342	45090	0	0
	191	148	45090	0	0
	193	26	45090	65	385
	194	0	45090	185	1118
	195	0	45090	193	25
	196	85	45090	0	120
	197	286	43376	0	0
	198	225	43376	190	90
	199	295	43376	45	120
	200	136	43376	165	65
	201	850	28289	0	10

2010 Socioeconomic Characteristics
(cont.)

	ZONE	# OF HH	1980 INCOME	EMPLOYMENT RETAIL	EMPLOYMENT N-RETAIL
	202	291	28289	0	309
TOTAL		4711		1195	2355
WESTON	64	492	42855	5	50
	65	441	44077	0	220
	66	363	51421	60	950
	67	602	52233	68	250
	68	280	54501	0	530
	203	271	44077	0	0
	204	275	51421	250	881
	205	250	52233	30	1963
	206	360	52233	0	300
	207	196	51421	0	200
	208	260	54501	0	50
	209	360	54501	0	0
TOTAL		4150		413	5394

Appendix G

2010 No-Build Assumptions

2010 No-Build Assumptions

MARLBOROUGH

1. New I-495 interchange

2. Four lanes on Rt. 20 west of I-495 (developer mitigation)

3. Exclusive left-turn lane onto Ames Street

4. Boundary Road extension to Solomon Pond Road with access to I-495 (traffic signal; channelization island; left-turn lanes and lane widening; 12 mile bridge over Assabet River)

5. Felton Road By-Pass (Felton Road right in and out)

6. New roadway on B&M right-of-way between Fitchburg Street and Hudson Street

7. Lincoln and Stevens Intersection
   a. Exclusive northbound right-turn lane
   b. An additional through lane eastbound
   c. An exclusive westbound left-turn lane
   d. No southbound left-turn

8. Curtis and Post Road Driveway @ Rt. 20
   a. An additional left-turn lane for southbound moves
   b. An additional eastbound through lane
   c. An additional westbound through lane and an exclusive right-turn lane
   d. Four lanes on Rt. 20 between Curtis Avenue and Hosmer Street.

9. Hosmer Street
   a. Additional eastbound left-turn lane
   b. Additional westbound through lane
   c. Two southbound left-turn lanes

10. Wilson Street and Farm Road
    a. Four lanes on Rt. 20
    b. A northbound right-turn lane on Farm Road

11. Indian Hill Shopping Center
    a. Addition of East and West Site Drives

12. Four lanes on Rt. 20 between Raytheon And Wayside Inn Road

SUDBURY

1. Left-turn lane between Nobscot Road and Union Road
2. Right turn in and out driveway from Sudbury Farm Market to Rt. 20
3. Increased capacity on Rt. 20 between Nobscot Road and Concord Road (signal coordination)

WAYLAND

1. Signal optimization at Rts 126/27

WESTON

1. Minor capacity improvement between School and Wellesley Streets

Appendix H

Announcements and Agendas

Newspaper Clippings

METROWEST TRANSPORTATION TASK FORCE

June 20, 1991

2:00 PM

Natick Town Hall
Room 207

AGENDA

Route 20 Corridor Study - MetroWest Growth Management Committee Comments on Draft Final Report

MWTTF620.A

May 30, 1991

To: Wayland's Route 20 study Committee

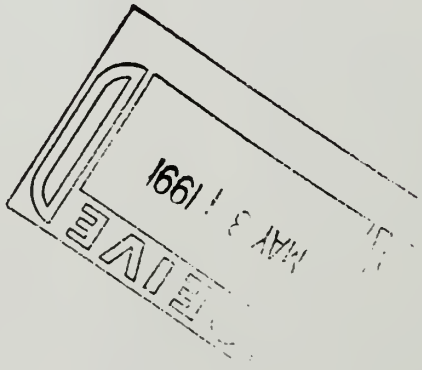
From: Martie Taub

Next meeting is the evening June 19, at the Town Building. I will let you know the time later.

Please have the requests (in writing) for data from CTPS to Cynthia Shanks by June 10, so that Effie can be prepared for the meeting.

Enclosed are the hand written notes from our last meeting.

28 Gnoard Roa
Wayland 0177



METROWEST TRANSPORTATION TASK FORCE

Tuesday, November 20, 1990

10:00 AM

Natick Town Hall
Room 207

AGENDA

10:00 Minutes

10:10 Route 20 Corridor Study: CTPS Corridor Study Team will present results of preferred "packages" and describe major intersection improvements that would be necessary to maintain reasonable traffic conditions under the preferred scenario.

For Route 20 Community Representatives:

Please Note:

CTPS hopes to proceed to final recommendations following this meeting. Your comments at this time are critical. If you are unable to attend the meeting, please send an alternate who is familiar with the Route 20 Corridor Study.

MWTT1120.A

METROWEST TRANSPORTATION TASK FORCE MEETING

MARCH 6, 1990

2:00 PM

LOWER MEETING ROOM, NATICK TOWN HALL

AGENDA

2:00 Minutes

2:10 Proposed Development Updates:

- o Hampton Inn
- o Massport Express Relocation
- o Mass Broken Stone
- o Kings Crossing Plaza
- o Crossroads West Shopping Center
- o New England Development (DOW)
- o Marlborough West CAC - TMO

2:30 MetroWest Transportaton Improvement Project (TIP) Prioritization: Dan Fortier, Birgit Uehling, MAPC

- o Project list will be narrowed down to top ten projects today.

NOTE: Both the time and the meeting room for today's meeting have been changed from the regularly scheduled time and place.

MWTTSS90/2-22-90/AGM 2

METROWEST TRANSPORTATION TASK FORCE

APRIL 25, 1989

NATICK TOWN HALL
ROOM 207

3:00 PM

AGENDA

3:00 Minutes

3:05 Route 20 Corridor Study -
Short Range Element Addendum - Efi Pagitsas,
Central Transportation Planning Staff

3:45 Transportation Feasibility Study: Route 9 Bus Service and Transportation Management Organization

4:00 Updates: Marlborough West Area Master Plan
TIP Prioritization
Route 9 Corridor Study

4:30 New Business

METROWEST TRANSPORTATION TASK FORCE

AGENDA

January 10, 1989

Natick Town Hall
Room 207

3:00 PM

3:00 Minutes - Old Business

3:15 Route 20 Corridor Study -
Short Range Element Recommendations -
Central Transportation Planning Staff

4:00 New Business

ROUTE 20 TASK FORCE MEETING

FRIDAY, OCTOBER 28, 1988
9:30 A.M.
MILLBURY SELECTMEN'S ROOM
MILLBURY TOWN HALL
127 ELM STREET

A G E N D A

1. Approval of Minutes of Meetings on September 22 and 29
2. Existing Land Use in the Corridor
3. Trucks on Route 20
4. Other Business

One Way Only

Weston officials wary of state proposal for School Street

By Keith Lyle

Access to Weston Center via School Street would be blocked if a state proposal to make the road one-way is accepted by town officials.

The proposal from the state Central Transportation Planning Staff was made as part of a study to recommend ways to alleviate traffic on Route 20 and surrounding local roads from Marlboro to Weston.

One preliminary proposal from CTPS would create a counter-clockwise traffic circulation along Route 20 near the Center. School Street would become one-way southbound between Old Boston Post Road and Wellesley Street; Wellesley Street would itself become one-way northbound between School Street and Old Boston Post Road.

The Post Road would also become one-way westbound between Route 20 and School Street.

Planning Board members are questioning whether the one-way proposal would increase traffic on local roads and through the Center while creating a smoother traffic flow on Route 20. The board may use information from the study in future traffic planning to prepare for development at Massachusetts Broken Stone.

One advantage of the one-way system, according to the study, is the creation of greater traffic capacity on the streets because the whole roadway would be used for one direction.

A disadvantage is that it would increase travel time to the Center for diverted drivers and would increase traffic at the intersection of School Street and Wellesley Street.

Planning Board Chairwoman Ingeborg Uhlir says providing for additional traffic volume on local roads is not necessarily positive.

Planning Board member Donald Myers says one-way travel through the Center may be a good idea but additional one-way proposals should be carefully considered.

The one-way proposal was eliminated by CTPS last year from the short-range plan for traffic reduction after a meeting where Weston officials rejected the idea. The one-way proposal has been included on the long-range plan for future consideration towards improving traffic flow on Route 20.

"We're back to square one considering the original proposal," says Uhlir who questions placing the one-way plan on the long-range proposal.

Recommendations from CTPS for changes, one way or another, of Weston roads could not be implemented without approval from the Board of Selectmen who have control over local roads.

Selectmen Joseph Mullin replaced Jean Thurston as the board representative to the MetroWest Growth Management Committee, which considers local traffic issues, but has not yet been briefed on the CTPS proposals.

"It is absolutely not within the state's authority to say, 'Thou shall make these one-way,'" says Uhlir.

The Planning Board is sponsoring a community meeting June 19 at 8 p.m. in Town Hall with residents, town officials and state road planners to discuss various Route 20 proposals.

Changes made late last month by CTPS on their short-range plan were based on comments made by local officials on the preliminary proposal, says Matthew Currie, state Department of Public Works liaison to CTPS.

The report, compiled by CTPS for the DPW, examines ways for improving intersections with Route 20 at Wellesley Street and Old Boston Post Road- Highland Street; and with Old Boston Post Road-School Street-and Summer Street.

The revised short-range plan recommends installation of a traffic signal at the Route 20 intersection with Wellesley Street and Old Boston Post Road. The signal may only operate during peak travel hours.

Route 20 eastbound, between the intersection and the Route 128 ramps could be striped for two lanes without having to widen the road.

At Route 20 and School Street, the revised plan recommends adding left turn lanes and two receiving lanes on the Route 20 eastbound approach to the intersection. Signals would be replaced in addition to the redesign of the intersection.

The year-long study was launched because the volume of traffic on Route 20 through the four towns has increased in recent years due to area development and its contact with major roads, including the Massachusetts Turnpike and Route 128.

Currie says traffic on Route 20 is not primarily generated by Marlboro-Boston travelers but by north-south travelers. The Raytheon facility on Marlboro and Sudbury also creates a lot of traffic.

There are no short-range proposals to widen Route 20 due partly to a lack of available state funds.

"I don't know if I personally see it in the cards going four lanes through all these towns," says Currie.

The study determined, based on police records from the past several years, that of all the intersections studied, the one at Route 20 and School Street is the most dangerous with an average of 14 accidents a year.

Most of the accidents at the intersection are rear-end collisions and are often due to poor signal visibility and frequently backed-up conditions, according to the study.

The accident rate at the four intersections is still below the state average despite accounting for an average of 15 percent of all Weston accidents.

The Planning Board is now accepting applications from traffic engineers to prepare for a study on the impact of a Massachusetts Broken Stone development, says Planning Board member Susan Haber. The local study will not begin until an environmental study report on MBS is complete.

The board will begin these engineer interviews within the next three weeks, says Haber.

Tab June 13, 1989

Route 20 plan draws much fire

By AMY B. RESNICK

WESTON — Planning Board members and residents will meet again to discuss the technical information used in preparing a Route 20 Corridor Study that brought many residents out to a forum this week.

Residents were obviously annoyed Monday night when told that the principal planner on the study would not attend the Planning Board forum because of a family emergency.

The forum had been scheduled by the Planning Board to discuss the preliminary recommendations made in the Metro Area Planning Council (MAPC) study of the town's main artery. The study, in fact, dicusses traffic flow on the length of Route 20 from Route 128 in Weston to Route 495 in Marlboro.

The Route 20 Corridor Study was "funded to address growing congestion around the region," explained Planning Board member Susananne Haber who represents the board in the Metrowest Growth Management Committee. The growth management committee, formed to address issues that affect many towns, paid for the study through its parent organization, MAPC.

One way

Most of the 20 to 30 residents at the forum came out to oppose the plan's preliminary recommendation that called for creating a one-way system of traffic in the area between Wellesley Street and School Street on Route 20. The original suggestion for this move was made as a short-term recommendation.

More recently the planners have revised their recommendations keeping the current two-way traffic flow. The only change to current traffic patterns in the revised short-term plan calls for the installation of a traffic light at Route 20 and Wellesley Street.

Planning Board members pointed out, however, that the one-way option has not been eliminated as a long-term recommendation.

Though not dealing with the technical aspects of the study, Haber did explain some of the philosophy behind its suggestions.

The state, Haber said, "does not view Route 20 as a major commuting corridor" like Route 9. Therefore, she added, the recommendations can be very sensitive to the character of the community.

She also pointed out that the study's suggestions are "merely recommendations" and that anything that affects local roads must get approval from the Board of Selectmen.

"Local roads are under local jurisdiction," said Haber. "The DPW doesn't have the authority to come in ... nor do they want to impose" their recommendations on the town.

see page 15

★Route

Continued from Weston's front page

Most of the recommendations made in the short range study propose the use of traffic signals to adjust traffic flo[illegible]long Route 20.

According to the abstract of the short range study, its purpose is to "identify improvements that can be implemented relatively quickly and inexpensively, such as pavement restriping, sigaal installation, signal retiming and rephasing, and replacement or repair of signal equipment."

The concerns

The residents present at the forum came primarily from the Wellesley Street and Maple Road area. They expressed concern over traffic plans that would send more traffic into their neighborhood onto what they called "already overcrowded" streets.

Many of the residents questioned why they hadn't been personally notified, first of the study, and second of Monday night's forum.

"It seems that you are taking in consideration traffic, not taking into consideration the residents," said one resident at the forum.

Planning Board Chairman Ingeborg Uhlir told those present that the forum was planned by the board for the residents' benefit and to get residents' comments.

"This is not a required procedure," Uhlir said.

Residents questioned the Planning Board's philosophy toward traffic planning in Weston. They were told by Uhlir that the board is "strongly tuned in to the fact that the public is strongly against through traffic" in Weston.

Another forum

The Planning Board told all those present at the forum that a meeting with residents and the study's planner to go over technical aspects of the recommendations will be scheduled.

By a show of hands, the residents indicated that it would be better to plan the forum for after Labor Day. Regardless of when the forum is planned, the Planning Board agreed to notify everyone at this week's forum of the new date and time.

Wayland - Weston Town Crier
6/22/89

Braced for Route 20 study

Town leaders fear state plan will worsen Wayland traffic

Wayland officials are fearful that a state plan to reconstruct Route 20 could divert more traffic onto the town's already congested roads.

By Leigh Hurwitz
TAB Staff Writer

WAYLAND — Town leaders are wary that the state's soon-to-be- released draft of the Route 20 Corridor Study could add to Wayland's chronic traffic problems.

The study, which the state has been working on for nearly three years, is expected to recommend, among other things, that Route 20 be widened in Marlboro so lanes can be added.

While welcoming minor improvements to Route 20 in Wayland, Planning Board member George Ives and others are worried that if the Marlboro roadway is widened the extra traffic will siphon into Wayland, clogging the town's already congested roads.

"Wayland already has more traffic than it can handle," Ives said.

Might not hurt town

But according to Rosamond Delori of the MetroWest Growth Management Committee, which worked with the state to develop the study, additional lanes in Marlboro will have no effect on traffic in Wayland.

Her statistics show that most cars on Route 20 in Wayland are traveling within town, or are going between Wayland and Sudbury.

"There are virtually no cars that travel from (Interstate) 495 to 128 using Route 20," Delori said. "That just isn't the road's function. Those cars would use the turnpike or Route 30."

Because recommendations for Wayland are minor, Delori said, they should not spark much controversy.

Most of the suggestions focus on the Wayland Center intersection, which Police Lt. Gerald Galvin calls a "rush hour bottleneck." The report recommends new traffic lights and an extra lane to ease congestion.

"It's about time that the traffic problem is being addressed," Galvin said. "At 8 in the morning and 5 at night, there are cars lined up at the intersection for as far as the eye can see."

Neighbor could suffer

Officials in Weston may have more complicated changes on their hands.

According to Planning Board Chairman Ingeborg Uhlir, the study could recommend changing some two-way streets to one-way, and adding a third lane eastbound on Route 20 between Route 128 and School Street. Uhlir is worried that several of the report's recommendations are contrary to Weston's residential nature.

The state is expected to give the towns copies of the study in early February. The Wayland Route 20 Committee will examine it first before passing it on to the Board of Selectmen.

Selectmen Chairwoman Marcy Crowley said the board will hold public hearings on the suggested changes before giving the plan its stamp of approval.

Changes minor, official says

With the release of the state's Route 20 Corridor Study just weeks away, anticipation is mounting over what recommendations the report will make for Wayland.

According to Rosamond Delori of the MetroWest Growth Management Committee, which has been working with the state in preparing the study, any changes in store for Wayland will be minor.

They may include:

- New traffic lights at the Wayland Center intersection to manage increased traffic
- A second eastbound traffic lane at that intersection to ease traffic congestion. There are now two westbound lanes, but only one eastbound lane.
- Traffic lights at Old Connecticut Path and Route 20 to handle increased traffic
- Sidewalks along certain stretches of Route 20

Each of these changes will require a public hearing and the approval of several town boards. The target for completion of the changes is 2010.

TAB Classifieds Reach Over 360,000* Readers Each Week. Call the Classified Line 969-2610

WAYLAND NEWS NOTES

Route 20 study

Residents got a chance to air their views on the Central Transportation Staff Route 20 corridor study at the selectmen's meeting on Monday. The study looks at traffic along route 20 from Marlborough to Weston. In Wayland the study proposes that the intersection at Routes 20, 126 and 27 be reconstructed. On Pelham Island Road "do not block intersection" signs, and traffic channelization is reccommended. Sidewalks all along Route 20, and a commuter park-and-ride lot is also sought. Martha Taub, chairman of the Route 20 study committee, stressed that the changes will only occur if the town wants them. Representative Hasty Evans said there may be some money in the Transportation Bond Bill to complete some of the short range reccommendations. Residents said that just changing the signaling of the light at the 20/126/27 intersection would go a long way to improve things. The selectmen were asked to write the Department of Public Works so some of the designs on the short range plans can be done. July 21 is the comment deadline for the study. A copy of the study is available at the library and the Town Building.

Rte. 20 brings an urban problem to the country living in Sudbury

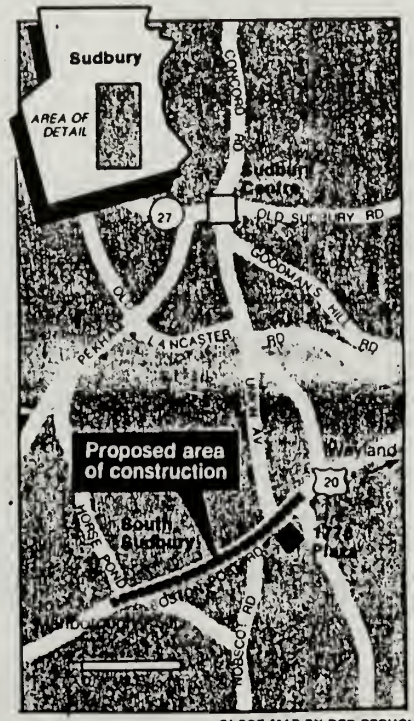
By Ray Richard
Globe Staff

SUDBURY – The First Parish Church of Sudbury, with its white clapboard walls, three-tiered steeple and Roman-numeral clock, presides with colonial charm over the Town Common where Minutemen mustered for the march to Concord on April 19, 1775.

On another side of the common, the Town Hall with its four Ionic columns, the Presbyterian church and the Grange Hall, all painted white, add to the historic appeal of this community of 14,500 residents 20 miles west of Boston.

Colonial architecture, stone walls and farmland keep most of Sudbury rural. But two miles from the common, a usually urban problem is interfering with country living.

Traffic congestion on Rte. 20, worsening as the town's population grows, is angering motorists, worrying police, harming some businesses, and causing the town to wonder how much more commercial development it should allow along the highway.



GLOBE MAP BY DEB PERUGI

Help for motorists who use Rte. 20 (Boston Post rd.) is on the way, says the Massachusetts Department of Public Works. The DPW plans to widen the roadway to four lanes from two and install two sets of traffic signals along the one-mile strip where most of the congestion occurs, says Frederick P. Salvucci, secretary of transportation and construction.

The $1-million improvements will not begin for at least two years, however, because of time needed for public hearings, land-taking and environmental studies. And driving conditions are likely to get worse before they improve.

"The road has arteriosclerosis," Victor Mangini, a 20-year Sudbury resident, says of the two-lane highway that runs through the town between Wayland and Marlborough. "It's a skinny artery where the traffic cannot move very well. During the morning rush hours, from 4 to 6 in the evening, and on Saturday mornings, it's a farce. Motorists get trapped on it. Tempers get lost. People get mad at each other."

Mangini's complaints, like most criticism of the road, focus on a two-mile stretch where most of the town's retail businesses are located. Shopping plazas, ice cream shops, gasoline stations and other stores line the highway, and two more shopping malls are being built along the road.

There are no traffic signals and much of the congestion is caused by motorists waiting to make left turns. Peter Lembo, acting police chief, explains. "The traffic there is horrendous," says Lembo. "The road has not been able to handle the traffic for five years. I've seen cars backed up 11 miles to Weston because of an accident. My biggest worry is what will happen while they are improving the road. The drainage alone will take six months."

SUDBURY, Page 28

■ **SUDBURY**

Continued from Page 25

The highway attracts much through travel between Rte. 128 and Interstate 495. The road is used extensively by shoppers from Sudbury and neighboring communities. About 19,000 vehicles pass through the area daily, says Edward Fernandes, DPW assistant design and estimate engineer.

Adding to the congestion during commuter hours are the 4400 employees of two Raytheon plants on Rte. 20, one near Nobscot road, the other four miles away in Wayland.

Richard E. Thompson, executive secretary to the selectmen, calls the Rte. 20 traffic "a major town issue."

An effort to pass a moratorium on new commercial buildings on Rte. 20 was debated at town meeting last spring. The measure received a majority vote, but not the two-thirds necessary.

Some businesses voice no complaints about the congestion.

But others say the long lines of cars keep customers away. "I might just as well close down at 3 in the afternoon," says Mary Webb, owner of Crumble Station, a cookie bakery on Union avenue a few hundred yards from Rte. 20. "Cars get backed up all the way to here, and people don't want to try to turn in."

Sudbury ponders zoning proposals

3-12-83

By LEONARD F. MORLEY JR.
News Correspondent

SUDBURY — Selectmen Monday delayed taking a stance on a controversial zoning bylaw amendment but took under advisement an alternative proposal drafted by residents concerned with further business development along Rte. 20.

Selectmen said they wanted to review the minutes of a Planning Board public hearing held two weeks ago on the Town Meeting article before taking any official position, so that they may more accurately gauge public opinion on the subject. Residents will vote at annual Town Meeting April 1 whether to create a 7.2-acre business district along Rte. 20 between Landham Road and land owned by Boston Edison.

The property, which is now zoned residential, has been owned for the past 54 years by the family of Water District head George Mercury and is the site of the Mercury greenhouse, which has paid commercial taxes for the past three years.

Mercury told residents at the Planning Board public hearing that he plans to make an amendment on the floor of Town Meeting that would call for rezoning the parcel to allow only limited business use. A limited business district would preclude industrial development of the land but would allow for the construction of office buildings or a shopping area such as Sudbury Crossing.

On Monday, however, selectmen heard residents reiterate their opposition for any kind of business use of the property.

Pat Drobinski of 222 Boston Post Road, introduced to the board a "newly formed but very active and concerned group" of Sudbury residents seeking a negative recommendation of the article from selectmen. Calling themselves Citizens Against the Urbanization of Sudbury's Environment, the group submitted a counter-proposal that would investigate possible residential uses of the land in conjunction with the present owners, in order to maintain its current zoning and preserve the value of surrounding properties.

"We don't want any kind of industry or business there at all," Drobinski said. "We are willing to work with George Mercury to find residential alternatives. We feel that the town could use housing for the elderly.

Board member Josiah Frost expressed some initial reservation to officially supporting the group's proposal.

"George Mercury has the right to ask for rezoning," said Frost. "It is the prerogative of the townspeople to approve or not.

"Being a long-time resident, Mercury has the right to get what he thinks is fair market value," he continued. "He might get half the property value if it's sold as residential."

In other action, selectmen approved a revised site plan for the construction of two two-story office buildings at 57 Codjer Lane. Selectmen were satisfied that A and M Realty Trust had made recommended landscape changes and improved lighting, as requested by the Conservation Commission, as well as filling in less of nearby wetlands.

Rte. 20, Sudbury 12-12-84

Road widening drive accelerating

By MARY TIMM GOMES
News Staff Writer

SUDBURY — Town officials intend to meet with state transportation decision-makers throughout the holidays to push the widening of Rte. 20 further up on the state's list of projects for next year.

Thanks to a private pledge of financial support from Raytheon Co., Executive Secretary Ed Thompson said he hopes he can finally convince state Department of Public Works officials that the time has come to widen the road where it bottlenecks at Nobscot Road.

Thompson said that in connection with Raytheon's planned expansion, due to increase its building area by a third directly opposite the Nobscot Road intersection, the company has agreed to pay for installing traffic signals and widening a nearby portion of Rte. 20.

According to Thompson, that is the most expensive portion of the proposed widening from Union Avenue to the fire station.

Once that portion of the project is completed, westbound traffic could continue flowing, rather than halt for every left turn at the intersection.

The project has been repeatedly delayed, with the latest setback contained in an updated list of proposed road projects planned by the state Department of Public Works, called the Transportation Improvement Program.

Annually for the past several years, Thompson and various local officials have gone to Boston to campaign for the widening project.

On the state's new list, the widening of Rte. 20 from Union Avenue to the fire station and installation of signals at Nobscot Road is not slated to be started for at least two to five years.

After a similar setback last year, town officials had hoped the project would be on the list for 1986.

The same problem was faced in 1982. In May of that year, town officials were told the bids for the widening would be advertised by the following October, but they were not.

After a fight, local officials were told that guidelines based on how far along design of the project was could be bent.

At that time, in 1982, the design status was listed at 70 percent complete, 5 percent short of the 75 percent needed to move the widening onto the state's list of priorities for 1983.

To everyone's confusion, the design status for the project is still listed at 70 percent on the state's list.

Thompson said the current delay doesn't make sense because a private engineering firm has been assigned to the widening.

Rte. 20, Sudbury, site

Raytheon Co. to build 2 radar towers

By CHARLES ARMSTRONG
News Correspondent

SUDBURY — Raytheon Co. executives unveiled plans to build two 100-foot radar towers behind their Boston Post Road plant, during a Planning Board meeting Monday.

Raytheon spokesman Skip Sweitzer told the board that the project would not bring more people or cars to the area.

"We intend," Sweitzer said, "that the structures be temporary and eventually be shipped to customers."

One tower, called "Nexrad," will be a weather radar tower which will give more accurate information about tornado warnings and how much rain is falling. The other tower, called "Ramp," would be used in air traffic control along the Canadian border and would be a joint system with Canada.

Once the radar towers have been perfected they will disassembled and shipped to customers.

The Planning Board must review and approve all new construction before it can be built.

Although the board took no action on the plan, members did express concern over the amount of radiation the equipment would give off.

Sweitzer assured the board that the projected radiation levels would be well below the state standard. "Our experience has been that actual radiation level is about half of what we project."

Planning Board member Jim Hanoosh expressed concern for people walking along the railroad tracks behind Raytheon. "What about radiation level there?" he asked.

"It's about one-fifteen-hundredth of the state standard there," assured Sweitzer.

"I'm concerned about people getting too near the things," worried Hanoosh.

"There's a fence," answered Sweitzer.

"Would you feel comfortable if your kids were playing down at those tracks?" questioned Hanoosh.

"Yes. My kids, my wife, myself. We plan to share with the Board of Health all measurements of radiation."

John Dobrinski, another board member, asked, "What about the interference effect on televisions and radios?"

"There should be none," assured Sweitzer. "However, if it should occur, we are prepared to black out the radar signal on that section." Raytheon officials assured the board that they have also taken into consideration how the towers might look from the roads nearby.

"When the trees are in foliage you won't see the towers at all," Sweitzer said.

2-28-85

Zoning article's fate hinges on board nod

By LEONARD F. MORLEY JR.
News Correspondent

SUDBURY — A controversial Rte. 20 zoning change will probably not see a vote at this year's Town Meeting if the Planning Board holds to its expected negative recommendation.

Newly elected Moderator Thomas Dignan said at a Town Meeting procedural review held during Wednesday's meeting of selectmen that Planning Board disapproval of the Mercury property zoning change for property at the corner of Landham Road and Rte. 20 will render the motion illegal.

Dignan based his comments on a rule which states that an article voted down at Town Meeting cannot be reconsidered within two years of its original appearance at Town Meeting, unless the Planning Board recommends its approval.

An article identical to this year's zoning change request last year asked voters to permit business construction on a residential parcel owned by the family of Water Commission Chairman George Mercury. It was defeated.

"If the Planning Board says its position is affirmative," Dignan said, "(the article) can be brought up." But Planning Board members present at the warrant review made it clear that there would be an objection on the floor of Town Meeting.

If the board indeed does officially disapprove, a motion will be made to "indefinitely postpone" any action on the article. In light of the expected Planning Board recommendation, any further consideration this year would become illegal and ruled out of order, according to Dignan.

Such a postponement would, however, make it possible for supporters to place the same article on the warrant for next year's Town Meeting.

The waiting period is scheduled to end two years from the date of its defeat last year, and could expire before, during or after next year's Town Meeting.

Dignan said this uncertainty could result in some "tactical maneuvering between proponents and opponents" of the article. "Selectmen could place the article high on the warrant," thereby passing it over, he explained. "Or supporters could filibuster until the end of Town Meeting when the two years might be up."

In separate action, the Board of Selectmen approved a liquor license transfer from the owners of Winchester's at 120 Boston Post Road to a group of restaurateurs doing business as Matt Garrett's.

Matt Garrett's president, Charles Jaffe of Dedham, told the board that his group plans "to run Winchester's as Winchester's for the next month while the building is being remodeled into Matt Garrett's." There are presently two Matt Garrett's, according to Jaffe, one in Brookline, the other in Brockton.

Jaffe claimed differences between Winchester's and Matt Garrett's would be minor and said that liquor sales would be used only to support the food end of the restaurant. "Liquor sales at the other two Matt Garrett's account for about 25 percent of our total income," he said "We have no intention of increasing that amount in Sudbury .. but I hope you realize that it is nearly impossible for a restaurant to survive without it (a liquor license)."

Selectmen also approved a technical change that will allow the Sudbury Bowladrome to continue operation as a limited partnership rather than a corporation. Licensing was granted for the operation of the bowling alley, with billiard tables and computer games inside, to the same individuals as previously licensed, according to Northeast Recreation Co. Ltd. spokeswoman Helene White, with only the legal entity being changed.

Conary wants limits on Route 20 projects

by Toula Vlahou
Staff Writer

MARLBORO — Mayor Chester E. Conary, in a press conference yesterday, encouraged the City Council to limit Raytheon and Fafard's industrial projects because they would hinder the city's attempts to control traffic gridlock on Route 20 east.

He said the two studies on traffic impact, one conducted by Raytheon and one by the state on behalf of Marlboro, are inconsistent with each other; the state's study contradicts much of the traffic data compiled by Raytheon, Conary said.

The study for the city was conducted by Robert C. Blumental, of the Traffic Operations Problem Solving unit under the state Department of Public Works.

It was conducted at the request of Conary, who, at a Jan. 10 meeting, asked state officials to determine the effect of proposed developments, including the Raytheon and Fafard projects.

The traffic data by Raytheon was included in the company's final Environmental Impact Report submitted to the state on Nov. 27. The city received the report on Feb. 14 and has 30 days to respond.

The major difference between the preliminary report and the final report is that Raytheon is now proposing to spend $657,000, up from $250,000, for road improvements to include: roadway widenings at the Lincoln Street and the Farm Road intersection; and improvements at the Hosmer Street intersection. Also, the company is proposing to establish a program for staggered work hours for the Raytheon plants along Route 20.

Both Raytheon and Fafard are proposing industrial parks. - OK cc p2-4.

In a letter to the City Council Conary wrote, "Our engineering department cannot conceive of any additional improvements to Route 20 east that would accommodate any other major developments. The Mass. DPW study shows that if Fafard and Raytheon are allowed to build, then it will take a minimum of 35 to 40 minutes for traffic to travel through the intersections that are located between Hager Street and the Stevens Street and Lincoln Street intersection." Under current conditions it takes between two to three minutes to go through those intersections, Conary said.

Conary added in his letter "This 36 to 40 minute travel time, which again is just the time needed to drive through the intersections during the peak a.m. and p.m. hours, assumes that the Raytheon traffic improvements are already in place."

Conary said that even if Raytheon's $657,000 worth of road improvements mitigate the traffic impact on Route, the problems with the Fafard project will persist.

He said although the city cannot stop Raytheon from building in the city, the city could, through legal means, try to control the Fafard project. Conary

Please turn to
ROUTE 20 — PAGE 5

(Continued from page 1)

added that the Fafard company, unlike Raytheon, has yet to submit an Environmental Impact Report to the state's Executive Office of Environmental Affairs.

He said the city will ask the state for an extension on the Blumenthal study.

The extension will give the city more time to pass legislation that will restrict development on Route 20.

Under the city's existing zoning, there are no devices to control development. He said when the city allowed strip zoning to occur in 1969, it permited developments to take place without planning.

"This is a major problem that is going to take the combined efforts of the mayor's office and the City Council to resolve. We cannot permit traffic grid-lock to occur in Route 20 east," he wrote in his letter to the council.

He said unless the city does something legislatively (placing a moratorium on building or establishing a site plan review process), the uncontrolled development on Route 20 east will continue to hurt the environment.

Appendix I

Comments on Draft Report and Responses

Weston Comments

TOWN OF
WESTON

Post Office Box 378
WESTON MA 02193
(617) 893-7320

PLANNING BOARD

June 25, 1991

Ms. Efi Pagitsas
Central Transportation Planning Staff
State Transportation Building
Ten Park Plaza, Suite 2150
Boston, MA 02116

RE: Route 20 Corridor Planning Study - Long Range Element

Dear Efie:

The Weston Planning Board has reviewed the CTPS Draft Route 20 Corridor Planning Study - Long Range element dated April, 1991. The Board appreciates the considerable efforts of CTPS in identifying problem reas along Route 20 and exploring a variety of alternatives for possible mitigation measures. We understand that this report is intended only as a study to guide and assist the towns along the Route 20 corridor in developing and designing their own preferred approach to the long term traffic problems related to Route 20.

The Planning Board conducted a public meeting to discuss the conclusions and recommendations of the CTPS study on June 19, which was well attended. There was general acknowledgement that certain traffic problems persist on Route 20, particularly during the peak commuter hours. However, the overwhelming consensus was that the problems that would likely be created by the proposed mitigation measures would outweigh the projected benefits of improving traffic flow during commuter hours.

In general, the priorities of the Town in its approach to Route 20 roadway and traffic issues must include the following:

-emphasis on vehicular and pedestrian safety;
-minimization of commuter traffic along residential side streets;
-protection of safe access of side streets and private driveways on to Route 20;

-preservation of the residential and semi-rural character of the Town.

There are certain short range improvements that may be considered by the Town to improve conditions at the School Street and Wellesley Street intersections. Other improvements are likely to be deferred in light of the issues raised by the above mentioned priorities and changing traffic forecasts due to changes in the economy.

The Town appreciates the overview that the Route 20 Corridor Planning Study provides of the long-term traffic growth projections and the origin destination patterns of Route 20 traffic. We will make use of this study as the Town continues to address problems along Route 20 and the Town's participation in the broader regional issue of commuter traffic. In this context, the Town would find it very helpful if the final draft of this report contained more of the hard data (for example, trip distribution and average daily traffic) on which the conclusions and recommendations of the report were made.

We also enclose a memo prepared for the Planning Board by Jane Howard, of Howard/Stein-Hudson Associates, Traffic Consultants to the Board that details certain inconsistencies and technical questions raised by Ms. Howard, that should be addressed in the final draft of the report.

Sincerely yours,

Donald B. Myers

Donald B. Myers, Chmn.

DBM:k
Encl.

cc: Roz DeLurie, MetroWest

HOWARD/STEIN-HUDSON ASSOCIATES, INC.
38 Chauncy Street, 7th floor
Boston, MA 02111-2301
Telephone No. (617) 482-7080

Fax No. (617) 482-7417

MEMORANDUM

TO: Mrs. Ingeborg Uhlir
FROM: Jane Howard
DATE: June 24, 1991
SUBJECT: Comments on Route 20 Study

As we discussed, I am summarizing in this memo several comments, minor corrections and inconsistencies which I found in reviewing the CTPS Route 20 study. Hopefully these adjustments can be addressed without major reworking of the text.

1) The analysis says the three lane scheme in Weston is based on needs in the AM peak hour; however, only PM data and capacity analyses are presented in the text. To help understand AM conditions and impacts, it would be useful to have AM and PM peak period turning movement counts for the Weston intersections in the technical appendix.

2) On page 65, it is stated that the two-lane EB, one-lane WB option adds 300 cars eastbound during the PM peak in Weston. This added traffic is not shown in Figure 3-8. The figure shows no change from No-Build. I think there might be other places where the graphics have missing volumes: this might be checked for all the options and all the towns.

3) In the graphics illustrating the impacts of the restricted left turn alternative in Weston (Figure 3-13), the volume assignment does not appear to be correctly indicated. The text on page 86 states that there is an increase of 90 left turns onto Highland St. and 160 left turns onto Old Connecticut Path. This would mean that 250 cars are added westbound on Route 2 from School Street to Highland Road, and 160 beyond Highland Road. However, the graphic shows only 80 cars added WB at Highland, and 50 fewer cars past Highland Street. Similarly, on Figure 3-14, there is not a reduction of 90 in through movements on the Route 20 westbound approach, since those cars were originally turning on School St. or Wellesley St.

4) It would be useful to have a graphic which illustrates the existing roadway widths in the various segments, indicating total ROW, width of travel way and shoulders, and whether or not sidewalks are present. This could go into an appendix.

5) In the conclusions section (page 129), the reasons why the one-way scheme were abandoned are not explained very fully. A little amplification would help clarify

MASSACHUSETTS BROKEN STONE COMPANY
WESTON, MASSACHUSETTS
02193 / 617-893-0489

CRUSHED STONE BITUMINOUS CONCRETE

July 19, 1991

Ms. Efi Pagitsas
CENTRAL TRANSPORTATION PLANNING STAFF
State Transportation Building
Ten Park Plaza - Suite 2150
Boston, MA 02116

Re: Route 20 Corridor Planning Study - Long Range Element

Dear Ms. Pagitsas:

I wish to thank you for the courtesies you have extended to me.

As a resident of the Town of Weston for forty-five years at 161 Boston Post Road; and for one year at my new residence at 165 Boston Post Road, I strongly advocate the recommendations of the Massachusetts D.P.W.

Every day, I leave my residence to go in an easterly direction on Route 20, which necessitates cutting through the westbound and eastbound heavy traffic.

While the signal light at School Street/Route 20, offers some gaps, the unregulated, confluent traffic from the populous south side results in a steady stream eastbound to Route 128. Please see R. Robinson's traffic graphic, dated 12/7/84, in addendum.

Similarly, the traffic from Waltham, with only a signal light at Cedarwood, has the unregulated off-ramp traffic from Routes 128 and 20, to make a steady stream in the westbound direction.

At the Weston Planning Board meeting of 6/19/91, a prominent Weston resident in the same block as I, (easterly of Wellesley Street, and Westerly of Route 128), in response to a discussion of whether the Town would pursue the recommendations of the C.T.P.S. Study, was quoted as follows: "Please do pursue it, we need more intervals; we have a dire need to do something..."

The Massachusetts Broken Stone Company's proposed development is mentioned in the C.T.P.S. Report on page 35, as attributing to the increase in non-retail employment in the Route 20 corridor.

A primary effort of MBSCo's development, dated January 29, 1985, parallels the 1985 effort of the M.D.P.W.'s 1985 Route 20 Study.

(Continued)

MASSACHUSETTS BROKEN STONE COMPANY
WESTON, MASSACHUSETTS
02193 / 617-893-0489

CRUSHED STONE BITUMINOUS CONCRETE

Although there have been several traffic studies made on Route 20, Hines Industrial, developer for MBSCo, retained Vanasse-Hangen as traffic analyst in 1985.

In summary, Vanasse-Hangen called for minor roadway widening and signal upgrading for the School Street/Route 20 intersection; and minor roadway widening and signal installation at Wellesley Street/Route 20 intersection.

Additionally, Route 20, between Wellesley Street and the project site, would be widened and restriped to a three-lane cross section with two eastbound and one westbound lane.

A few years later, in 1988, the Weston Board of Selectmen announced in March that negotiations between the Town and MBSCo resulted in a Settlement Agreement subject to Town Meeting action in May. At that May Town Meeting, with the unanimous support of the Selectmen and the Planning Board, the Town voted, by a margin of 75%, in favor of MBSCo.

The Weston Office Park development of MBSCo is still in the permitting phase in 1991.

In conclusion, I commend the C.T.P.S. and the M.D.P.W. for the careful Route 20 Corridor Study and hope that the improvements listed above may be implemented. soon to assure the safety of the Route 20 users and for the public interest of the Corridor towns.

Thank you for your cooperation.

Sincerely,

Richard Robinson P.E.

Richard Robinson, P.E.
President

RR:s
Enclosures-Addendum-traffic graphic
Notice of Public Hearing
Weston Planning Board Minutes

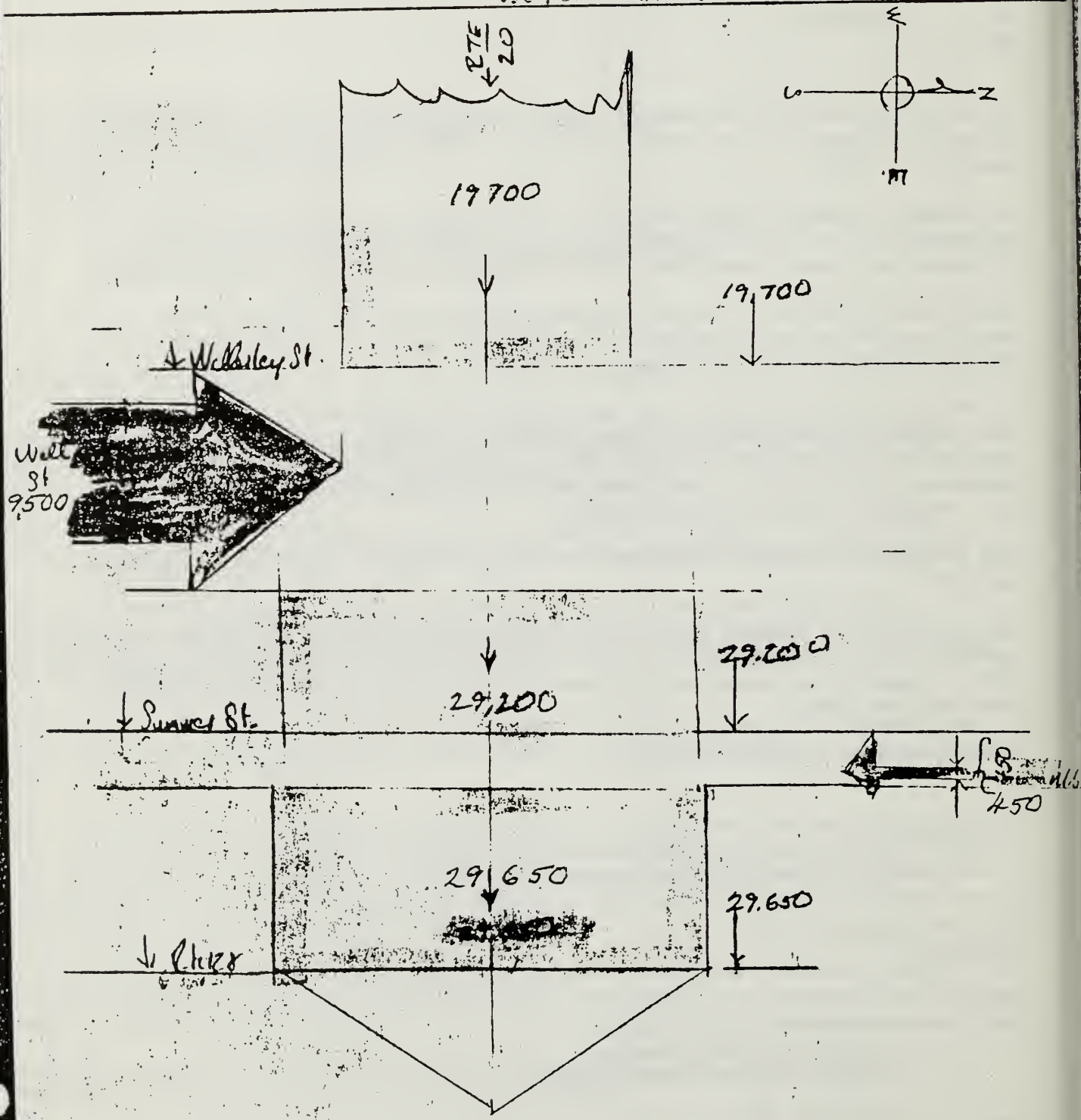
cc: D. G. Holland, Esq.
P. R. Robinson
A. Forrest
Michael Burke, Director
Bureau of Transportation Planning and Development

WESTON

TO Hixie Industrial FROM M Martinson

SUBJECT Traffic Graphic RTE 20 DATE 12/7/84

View from EAST BOUND 11:33 A.M.



Note: SIGNALIZATION REQU'D. AT WELLESLEY ST.!
48% INCR. TO RTE 20 TRAFFIC ON RTE. 20, AS A RESULT

Hor. Scale 1" = 10,000

Wayland Comments

TOWN OF WAYLAND
MASSACHUSETTS
01778

TOWN BUILDING
41 COCHITUATE ROAD
TEL. (508) 358-7701

July 5, 1991

Ms. Efi Pagitsas
CTPS
Ten Park Plaza, Suite 2150
Boston, MA 02116

Dear Efi,

The Wayland Route 20 Committee met on June 19, to review the draft Route 20 Corridor Planning Study. We submit the following comments:

The study process of including all towns in an integrated manner was excellent and should be used for all such studies. It was noted that this process attempting to recommend local solutions without increasing congestion was an excellent approach.

Comments of the a committee are the following:

- The CTPS Study recommendations met the guidelines establish by the committee (see attached)

- implementing the recommendations would not interfere or impede with a future study and/or design to improve trouble spots along Rt 20 in Wayland.

- The Selectmen request a a design based on the CTPS recommendation for Rt 20 and 126/27 intersection be drawn by the DPW. A public hearing should then be held and and implementation done following the town's input on the design.

- Strongly recommends:

  - existing sidewalk be maintained , reinstating sidewalk that existed east from Bennett Road to the Weston line on the south side of route 20. Complete necessary segments so an uninterrupted sidewalk will exist from the Weston line to the Sudbury Line.

  - the need for public transportation and commuter parking in Wayland.

  - Current bus service schedules be published in local newspaper

  - The data on which the this study is based ought to be updated when any of the recommendations thoughout the corridor are to be implemented.

Other comments were:

6 - Several typographical errors were noted.

7 - Need to specify whether certain modeling techniques were validated.

8 - Request that each town re-do traffic counts and movements prior to making these improvements and know that sufficient land use controls are in place.

9 - Need to specify what land use controls were needed to be integrated into traffic managements"

10 - comment on page 55 of the study should be emphasized
"...this finding is valid as long as there are sufficient land use controls" in place in Marlborough, Sudbury, Wayland and Weston to ensure that increased capacity (accessibility)of Route 20 does not induce new development along the corridor that substantially exceeds the land use projections used in this planning study"

We wish to thank you for the the work done on this study. The data, model and figures based on current zoning were to be designed to predict traffic up to the year 2010. It will be very useful to Wayland as basis for further study and review of problems, plans and and land use changes along Route 20.

Sincerely,

Martha C. Taub, Chair
Wayland Route 20 Committee

TOWN OF WAYLAND

MASSACHUSETTS
01778

TOM LANDRY
EXECUTIVE SECRETARY

BOARD OF SELECTMEN
MARCIA P. CROWLEY
DOROTHY M. HARRINGTON
GEORGE H. HARRIS
RANDY HOES
LEWIS S. RUSSELL, JR.

July 18, 1991

Ms. Efi Pagitsas
CTPS
Ten Park Plaza, Suite 2150
Boston, MA 02116

Dear Ms. Pagitsas:

The Wayland Route 20 Committee met with the Board of Selectmen on July 15 to review the draft Route 20 Corridor Planning Study. The Board was impressed with the scope of the study and the efforts of our volunteers in this endeavor.

The comments made by the Committee Chair in her July 5 letter are sound ones which this Board supports and commends. The Selectmen have requested that Mass DPW undertake a redesign of a key intersection at Routes 20/27/126 as recommended by the Committee. Further, the observations of the Committee relative to sidewalks are of particular importance to the Board. They request that "existing sidewalks be maintained...the sidewalk that existed east from Bennett Road to the Weston line on the south side of Route 20 be reinstated...and that necessary segments be completed so that an uninterrupted sidewalk will exist from the Weston line to the Sudbury line." Additionally, the need for public transportation and commuter parking in Wayland cannot be ignored.

I hope these comments will be incorporated into the study, and commend the efforts of your office and all of the volunteers which made it possible.

Sincerely,

George H. Harris

George H. Harris
Chairman
Board of Selectmen

rjs
att.

Sudbury Comments

TOWN OF SUDBURY

443-8891
ENGINEERING DEPARTMENT
I. WILLIAM PLACE, P.E.
TOWN ENGINEER

SUDBURY, MASS. 01776

June 26, 1991

Efi Pagitsas
Central Transportation and Planning Staff
State Transportation Building
Ten Park Plaza
Boston, MA 02116

Subject: Draft Route 20 Corridor Planning Study

Dear Efi:

The Town of Sudbury would like to go on record in support of the Route 20 Improvements. We are of the understanding that the final report will be used as a guide by the Department of Public Works when allocating funding for the Route 20 Corridor. The town will make every effort to implement the changes outlined in the final report.

In review of the Route 20 Corridor study, I would like to offer the following comments:

Alternative:

With regard to a two-lane Route 20 with improvements to critical locations, the report suggests that in heavily developed areas where significant left turns are made the roadway could be constructed into a three-lane sections with a continuous two-way left turn. We agree with this alternative; however, when I discussed this option with the District Engineers they had reservations with this practice. Perhaps prodding by the Central Transportation Planning staff would change their reluctance to this type of approach.

Include in the capacity analysis the following intersections:

Route 20 at Peakham Road

Route 20 at Wayside Inn Road

The report discusses the Nobscot Road intersection in the 2010 base scenario and the addition of the Union Ave. extention. In each case a traffic signal would not be warranted at Nobscot Road with the construction of a full by-pass. It would be helpful if the backup data and levels of service for each intersection were included in the report.

14 Figure 3-23 Sudbury full by-pass from Station Road to just west of Horsepond Road appears unlikely at this time or in the near future. The by-pass would require land takings; one parcel in particular, the Stone Tavern Farm which is currently under an "agricultural preservation restriction" would require Town Meeting vote and an act of the Legislature. The most likely route for the by-pass would be from Station Road west to Route 20 in the vicinity of the Chiswick Trading Company entrance.

15 The report suggests a possible location for the establishment of a commuter park and ride facility at the Sudbury/Wayland town line. There are two possible locations for this facility, the Old Wayland Landfill and an area east of the Wayland Septage facility. The Department of Environmental Protection would require quality assurance and quality control measures to protect the landfill cap, if parking is proposed on the landfill site. Adjacent to the septage facililty, the land is owned by the Town of Wayland. Perhaps a pilot program could be initiateld to determine commuter participation.

16 The final report should also include traffic counts, locations of counts, trip distribution and total volume of traffic for Route 20.

17 The final report should also include sidewalks (walkways) along Route 20 to promote pedestrian access.

Should you have any questions, as always feel free to contact this office. I'm looking forward to receiving the final report on the Route 20 corridor.

Sincerely yours,

I. William Place

I. William Place, P.E.
Town Engineer

IWP/pas

cc: Roz Delori
Bob Sloan
Ed Bates
Board of Seletmen
T.M.C.
Planning Board
Bob Noyes, Highway Surveyor

Marlborough Comments

CITY OF MARLBOROUGH
Marlborough, Massachusetts 01752

PLANNING BOARD

June 20, 1991

Effi Pagitsas
Central Transportation and Planning Staff
2nd Floor
10 Park Plaza
Boston, MA 02116

Re: Long Range Corridor Study, State Rt. 20

Dear Effi Pagitsas:

At its regular meeting held on Monday, June 17, 1991, the Planning Board took the following action:

The Board reviewed a synopsis of the State Rt. 20 Long Range Corridor Study.

On a motion made by Ms. Fenby, seconded by Mr. McGrath, it was duly voted:

To endorse the improvements proposed for Rt. 20 between Routes 495 and 128, particularly those within the City of Marlborough.

Very truly yours,

Paul J. Priestley

Paul J. Priestley, Chairman
MARLBOROUGH PLANNING BOARD

PJP/np

cc: Metro West Growth Management Committee

nisie-6-17-2d.wp

MetroWest Transportation Task Force Comments

Growth Management Committee
13 East Central Street
Natick, MA 01760
508·651·7350

July 1, 1991

Ms. Efi Pagitsas
CTPS
Ten Park Plaza, Suite 2150
Boston, MA 02116

Dear Efi,

The MetroWest Transportation Task Force met on May 20, 1991, to review the Draft Route 20 Corridor Planning Study. The Route 20 corridor communities were represented as follows: Marlborough, David Parry, City Planner; Sudbury, Anne Donald, William Place, Town Engineer; Wayland, David Berry, Town Planner; Marty Taub, Route 20 Committee; Weston, Ingeborg Uhlir, Weston Planning Board; Metropolitan Area Planning Council, Ed Bates; Roz Delori, MetroWest Growth Management Committee.

MetroWest submits the following comments:

General

The corridor study process and recommendations were commended.

The four Route 20 Corridor communities reaffirm the MetroWest statement in the Committee's December 4, 1990, letter to Bill Steffens ((Fig. 3-10) regarding the need for land use controls to promote the long term capacity of Route 20 and to assure the continuation of its predominant character as a two-lane arterial road.

Format

18 The Committee believes the study will be most valuable to communities if it includes an executive summary containing all recommendations and an "implementation" section describing procedures to follow to move projects to construction. In addition, communities request that the following data be appended

19 to the study: traffic counts with dates, times and locations, network diversion patterns for various scenarios and average daily traffic (ADT) on Route 20 at representative locations on

the corridor.

With this information the study can be effectively used to build consensus for implementation of its recommendations.

Marlborough: The report is now under review at the Marlborough City Council and has been endorsed by the Planning Board.

20 p. 134: The recommendation regarding sidewalks appears to apply only to Wayland. Marlborough commented that this recommendation should also apply to Route 20 in Marlborough. Sudbury and Weston concurred and support a revision of the study to include a recommendation for sidewalks, where appropriate, throughout the corridor, as requested in MetroWest December 4, 1990, letter to Bill Steffens, CTPS. (Fig. 3-10)

Sudbury: The report was reviewed by the Town Engineer on behalf of the Selectmen.

21 p.45: Sudbury officials had presented to District 4 plans to improve Route 20 including a three-lane configuration with a continuous two-way left turn lane. This plan was rejected by District 4 and Sudbury has since submitted revised plans without the continuous left turn lane. MetroWest requests that CTPS and MDPW agree on approved geometry to avoid such unnecessary efforts in the future.

22 p.107: Reference is made to capacity analysis of seven intersections while the study includes analysis of four intersections. The town and MetroWest had expected that the study would include analysis of Route 20 intersections with Peakham Road and Wayside Inn Road. If information is available for these locations, MetroWest requests that it be included in the study.

23 p.112: HMM Associates, Inc., consultants to Sudbury, have indicated that a signal would be required with the full bypass. It would be helpful if the study supported with analysis the statement that a signal is not required with the full bypass.

24 Figure 3-23 depicting the full bypass proposed geometry: Sudbury believes the proposed geometry has been precluded by the purchase of Stone Tavern Farm for agricultural conservation purposes.

25 Appendix Corrections: Housing developments included in 1995 forecasts: The following are correct spellings for Sudbury development listings:

Kestrel Ridge
Algonquin Oaks
Borden Hill Lane
Kato Drive
Ruddock Road

Wayland: The study has been reviewed by the Wayland Route 20 committee. The Selectmen will review the report in July.

Wayland believes that the study addresses the guidelines established by the Committee. The documentation of segmented character of trips on Route 20 will be helpful in taking action on the study. Wayland suggests that updated counts be taken after a corridor improvement project is constructed to evaluate its effect on the corridor, prior to proceeding with additional projects. 26

p.27 Table 2.5: Reserve capacity for LOS F should read 0 or less than 0. 27

Weston: The Planning Board has reviewed the study, following a public hearing.

Weston affirms the usefulness of the study as a planning document for future improvements to Route 20. There is particular public support for re-timing the School Street light, with a pedestrian phase.

Weston is concerned that the Vollmer Associates Weston access MBTA Study and the VHB Master Plan Feasibility Study were not referenced in the Route 20 Corridor Study. 28

MetroWest and its member communities have appreciated the spirit of cooperation with which the Route 20 Corridor Study has been conducted. The communities look forward to initiating its implementation as community consensus for projects is confirmed. Further more, the communities will evaluate new projects as they affect Route 20, with the completed corridor study as a guide.

At this time, MetroWest wishes to commend CTPS staff for their perseverance and knowledge that have resulted in the successful completion of the study.

Sincerely,

Judith A. Cope rpd

Judith A. Cope
Chairman

JAC/RPD/mjf

cc: MetroWest Growth Management Committee
Route 20 Corridor Committees

CTPS Responses to Comments

CTPS RESPONSES TO COMMENTS

Weston

1. The PM peak hour was chosen for traffic analysis of locations along the corridor because it is characterized by higher volumes than the AM peak hour. This can be seen by comparing Figures 2-2 and 2-3 of the report.

   The three-lane eastbound Route 20 scheme between Wellesley Street and Route 128 was proposed by Weston town committee members. The scheme aims to increase the processing rate of morning eastbound traffic away from the town center.

2. The graphics of the report were reviewed and missing volumes were introduced, including the missing traffic volume change of 300 vehicles in Figure 3-8.

3. The westbound left turn restrictions at School and Wellesley streets divert about half of that traffic, 250 to 300 vehicles, to Route 128 southbound. Consequently, this traffic disperses to locations in Weston and towns to the south through Route 30 westbound. The rest of the restricted westbound left turn traffic continues westbound on Route 20, past School and Wellesley streets. However, because of the freed-up capacity at School Street southbound (and Wellesley Street further south), the Church Street traffic turning right onto Route 20 apparently finds a shortest path and proceeds south instead. This shift of traffic results in a net decrease of 80 vehicles at School Street and a net increase of only 80 vehicles at Route 20 east of Highland Street. At Old Boston Post Road west of Highland, the left turn prohibition also causes a reduction in right turns onto Route 20, which contributes to a net reduction in Route 20 traffic of about 50 vehicles.

   In conclusion, while about half of the restricted left turn traffic stays on Route 20 westbound and eventually diverts to Highland Street and Old Connecticut Path, the added traffic is not immediately obvious because of turning movement shifts.

4. The requested information is provided in Appendix C.

5. The one-way circulation scheme was abandoned because it would cause traffic increases on Summer Street and attract traffic to southbound School Street through Church and Connant streets. Wellesley Street one-way northbound traffic would also increase compared to that of No-Build, but it would be appreciably lower than the two-way No-Build traffic. School Street one-way southbound traffic would be somewhat higher than that in the No-Build, but much lower than the total No-Build traffic (see Figure 3-12.)

Wayland

6. Typographical errors were corrected.

7. The traffic model developed for Route 20 was validated (calibrated) to 1987 traffic counts as described in section 3.3.1. The absolute average Root Mean Square Error (RMSE), that is, the model's calibration error, was less than 10%. This is considered to be an acceptable error for an extensive highway network such as Route 20's. The Route 20 model covered the area within Routes 117, 128, 135 and I-495.

8. Preliminary design of any construction has to be based on new traffic count information. This is done in order to make sure that the improvements are still warranted and to ensure that new traffic patterns (if any) are also taken into consideration.

9. Specification of land use controls for each town would be outside the scope of this study. There are numerous land use controls known: mixed use development, land use densities, site design strategies, trip reduction zoning, downzoning, impact fees and special assessment districts. Each of these contains a number of variations and strategies which can be found in the literature. However, the applicability and enforcement of each one depends on the development goals of the individual town.

10. The 2010 traffic volumes estimated for this study and the improvements identified are valid only under the land use assumptions made for this study. Any substantial deviation from these land use projections would alter the 2010 traffic volumes and therefore, the kind of improvements needed.

Sudbury

11. On page 34 it is stated: "In areas of denser development where traffic makes heavy left turns, the roadway might be reconfigured into a three-lane section with a continuous two-way left turn lane. The final configuration would be dependent on local need, community support, and the technical feasibility of making the desired improvements." We trust that District 4 staff had good reasons for their reservations about this configuration, based on its technical feasibility and, possibly, safety. CTPS is not in a position to comment on the feasibility of a "three-lane treatment" in Sudbury. This would require a traffic circulation analysis with detailed parcel and driveway information along Route 20, which is outside our scope of work.

12. The Long-Range Element of the Route 20 Corridor Planning Study was scoped to perform the analysis of the same intersections included in the Short-Range Element, in order to compare 1987 and future 2010 level-of-service assessments.

The intersection Route 20 at Wayside Inn/Hager Street is included in the analysis performed for the city of Marlborough.

13. At the time of the analysis, information on the new location of the western end of the bypass in the vicinity of the Chiswick Trading Company entrance was not available to CTPS. Therefore, the analysis presented in the report was done with the full bypass at the location shown in Figure 3-23. The following analysis sheets for Nobscot Road and Union Avenue show that, under the trip diversion capability of that alignment, Nobscot Road would not require the presence of traffic signal control.

14. Subsequent runs of the model with the new alignment (see following figure) indicated a reduced diversion capability of traffic off of existing Route 20. Also, under this scenario, Nobscot Road would have to remain a signalized intersection. This can be seen from the intersection capacity analysis sheets provided. Of course, the final determination of the need for a traffic signal will depend on traffic signal warrants being met at design time.

    Finally, the location of the bypass affects traffic patterns locally and only in Sudbury. Its location does not have any impacts on Weston, Wayland or Marlborough.

15. CTPS is in agreement with Sudbury's suggestion for a pilot program to determine commuter participation in the establishment of a park-and-ride facility. The location of this facility will have to be determined in consultation with the Department of Environmental Protection (DEP).

16. A summary of the requested information is provided in Tables 2-2 and 2-3 and Figures 2-2 and 2-3. Appendix B contains the hourly and directional distribution of traffic at Route 20 and other locations for the years 1986-1990.

17. Construction of sidewalks, where town-supported and feasible, is recommended as part of all projects recommended in this study. Sidewalk construction can not be a "stand-alone" MDPW project. As mentioned in the Conclusions and Recommendations sections of the report, after completion of any highway construction, the MDPW and the town where the project is located sign a memorandum of understanding (MOU) which assigns sidewalk maintenance responsibility to the town.

MetroWest Transportation Task Force

18. The requested Executive Summary was prepared and has been included in this report. All questions on project implementation and procedures to be followed by the towns should be addressed to District 4. Also, some general guidelines are provided at the end of Appendix A.

CINCH PROGRAM VERSION DATE 4-29-1988
1985 HCM - CHAPTER 9: SIGNALIZED - OPERATIONAL ANALYSIS
RTE 20 @ NOBSCOT
2010 SHORT RANGE
date:08-06-1990 time:12:16:56
LAST DATA SET NAMES LOADED OR SAVED
VOLUME=NOBCB GEOMETRICS=NOBCB SIGNAL=NOBCB
LOCATED IN CBD:N
VOLUME & GEOMETRICS

	VOLUMES			# OF LANES			LANE WIDTH			CROSS
DIR	LT	TH	RT	LT	TH	RT	LT	TH	RT	WALK
EB	0	970	87	0	1	0	0.0	12.0	0.0	0
WB	307	970	0	1	1	0	12.0	12.0	0.0	0
NB	28	0	232	0	1	0	0.0	12.0	0.0	0
SB	0	0	0	0	0	0	0.0	0.0	0.0	0

TRAFFIC & ROADWAY CONDITIONS

			ADJ PARK			PEDESTRIANS				ARR
DIR	GRADE	%HV	Y/N	MOVES	BUSES	PHF	CROSS	BUT	MIN TIME	TYPE
EB	0.0%	2.0%	N	0	0	.900	0	N	7.0	3
WB	0.0%	2.0%	N	0	0	.900	0	N	7.0	4
NB	0.0%	2.0%	N	0	0	.900	0	N	7.0	3
SB	0.0%	0.0%		0	0	.000	0		7.0	0

PHASINGS

	EASTBOUND				WESTBOUND				NORTHBOUND				SOUTHBOUND				GREEN	Y+R	PRE/ACT
	l	t	r	p	l	t	r	p	l	t	r	p	l	t	r	p			
1					*	*											16.0	0	A
2		*	*		*	*											74.4	3	A
3									*		*						23.6	3	A

CYCLE= 120.0

VOLUME ADJUSTMENT WORKSHEET
PART 1 (MOVEMENT ADJUSTMENTS)

DIR	LTV	THV	RTV	PHF	LTFR	THFR	RTFR
EB	0	970	87	.900	0	1078	97
WB	307	970	0	.900	341	1078	0
NB	28	0	232	.900	31	0	258
SB	0	0	0	.000	43	82	474

PART 2 (LANE GROUP ADJUSTMENTS)

DIR	LN GROUP	FLOW	N	LU	v	Plt	Prt
EB	TH-RT	1174	1	1.00	1174	0.00	0.08
WB	LT	341	1	1.00	341	1.00	0.00
WB	TH	1078	1	1.00	1078	0.00	0.00
NB	LT-RT	289	1	1.00	289	0.11	0.89

PART 3 (OPPOSING VOLUME ADJUSTMENTS)

LEFT TURN	OPPOSING APPROACH									
BEING OPPOSED	VOLUMES			% OPPOSING LEFT TURN			# LANES			OPPOSIN
	LT	TH	RT	LT	TH	RT	LT	TH	RT	VOLUME
WESTBOUND	0	1078	97	100	100	100	0	1	0	1174
NORTHBOUND	43	82	474	0	0	0	0	0	0	0

SATURATION FLOW ADJUSTMENT WORKSHEET

DIR	LN GROUP	IDEAL	N	Fwid	Frv	Fgr	Fpark	Fbus	Farea	Frt	Flt	s
EB	TH-RT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	0.889	1.000	1584
WB	LT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	0.950	1693
WB	TH	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1782
NB	LT-RT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	0.780	0.885	1230

CAPACITY ANALYSIS WORKSHEET

DIR	LN GROUP	v	s	v/s	g/C	c	v/c	CRITICAL
EB	TH-RT	1174	1584	0.74	0.62	982	1.20	*
WB	LT	341	1693	0.16	0.13	285	1.20	*
WB	TH	1078	1782	0.60	0.75	1343	0.80	
NB	LT-RT	289	1230	0.23	0.20	242	1.20	*

CYCLE=120.0 LOST= 6.0 SUM V/S CRIT= 1.14 TOTAL V/C= 1.20
FOR THE WESTBOUND PROTECTED/PERMISSIVE LEFT TURN LANE THE CAPACITY, V/S AND V/C RATIOS HAVE ALL BEEN ADJUSTED TO REFLECT A CAPACITY FOR
59 LEFT TURNS ON THE CHANGE INTERVAL AND 0 ON THE PERMISSIVE PHASE

LEVEL OF SERVICE WORKSHEET

DIR	LN GROUP	v/c	g/C	C	d1	c	d2	PF	Delay	LOS	Avg Q	95% Q
EB	TH-RT	1.20	0.62	120.0	25.44	982	107.68	0.85	113.15	F	44.3	112
WB	LT	1.20	0.75	120.0	28.03	285	128.83	1.00	156.86	F	19.8	46
WB	TH	0.80	0.75	120.0	7.01	1343	2.55	0.71	6.80	B	8.9	9
NB	LT-RT	1.20	0.20	120.0	38.48	242	133.00	1.00	171.48	F	17.6	42

DIR	Delay	LOS
EB	113.15	F
WB	42.88	E
NB	171.48	F

INTERSECTION DELAY = 84.40 INTERSECTION LOS=F

THE CYCLE LENGTH WITHIN THE BOUNDS OF 60 TO 120 SECONDS
WHICH MINIMIZES CRITICAL MOVEMENT DELAY IS 120.0 SECONDS

THE V/C RATIO CAN'T BE .95 FOR THE GIVEN CONDITIONS
THE EXISTING TIMING IS OPTIMAL

CINCH PROGRAM VERSION DATE 4-29-1988
1985 HCM - CHAPTER 9: SIGNALIZED - OPERATIONAL ANALYSIS
RTE 20 @ NOBSCOT
2010 NOBSCOT EXT
date:08-09-1990 time:14:27:27
LAST DATA SET NAMES LOADED OR SAVED
VOLUME=NOBNE GEOMETRICS=NOBNE SIGNAL=NOBNE
LOCATED IN CBD:N
VOLUME & GEOMETRICS

	VOLUMES			# OF LANES			LANE WIDTH			CROSS
DIR	LT	TH	RT	LT	TH	RT	LT	TH	RT	WALK
EB	239	718	88	1	1	0	12.0	12.0	0.0	0
WB	107	660	0	1	1	0	12.0	12.0	0.0	0
NB	28	146	86	0	1	1	0.0	12.0	12.0	0
SB	0	205	314	0	1	1	0.0	12.0	12.0	0

TRAFFIC & ROADWAY CONDITIONS

			ADJ PARK			PEDESTRIANS				ARR
DIR	GRADE	%HV	Y/N	MOVES	BUSES	PHF	CROSS	BUT	MIN TIME	TYPE
EB	0.0%	2.0%	N	0	0	.900	0	N	7.0	3
WB	0.0%	2.0%	N	0	0	.900	0	N	7.0	3
NB	0.0%	2.0%	N	0	0	.900	0	N	7.0	3
SB	0.0%	2.0%	N	0	0	.900	0	N	7.0	3

PHASINGS

	EASTBOUND				WESTBOUND				NORTHBOUND				SOUTHBOUND				GREEN	Y+R	PRE/ACT
	l	t	r	p	l	t	r	p	l	t	r	p	l	t	r	p			
1	*				*						*				*		15.9	3	A
2		*	*			*	*										51.7	3	A
3									*	*	*		*	*	*		13.4	3	A

CYCLE= 90.0

VOLUME ADJUSTMENT WORKSHEET
PART 1 (MOVEMENT ADJUSTMENTS)

DIR	LTV	THV	RTV	PHF	LTFR	THFR	RTFR
EB	239	718	88	.900	266	798	98
WB	107	660	0	.900	119	733	0
NB	28	146	86	.900	31	162	96
SB	0	205	314	.900	0	228	349

PART 2 (LANE GROUP ADJUSTMENTS)

DIR	LN GROUP	FLOW	N	LU	v	Plt	Prt
EB	LT	266	1	1.00	266	1.00	0.00
EB	TH-RT	896	1	1.00	896	0.00	0.11
WB	LT	119	1	1.00	119	1.00	0.00
WB	TH	733	1	1.00	733	0.00	0.00
NB	LT-TH	193	1	1.00	193	0.16	0.00
NB	RT	96	1	1.00	96	0.00	1.00
SB	TH	228	1	1.00	228	0.00	0.00
SB	RT	349	1	1.00	349	0.00	1.00

PART 3 (OPPOSING VOLUME ADJUSTMENTS)

LEFT TURN BEING OPPOSED	OPPOSING APPROACH VOLUMES			% OPPOSING LEFT TURN			# LANES			OPPOSING
	LT	TH	RT	LT	TH	RT	LT	TH	RT	VOLUME
EASTBOUND	119	733	0	100	0	0	1	1	0	0
WESTBOUND	266	798	98	100	0	0	1	1	0	0

SATURATION FLOW ADJUSTMENT WORKSHEET

DIR	LN GROUP	IDEAL	N	Fwid	Fhv	Fgr	Fpark	Fbus	Farea	Frt	Flt	s
EB	LT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	0.950	1693
EB	TH-RT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	0.984	1.000	1753
WB	LT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	0.950	1693
WB	TH	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1782
NB	LT-TH	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	0.816	1455
NB	RT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	0.850	1.000	1515
SB	TH	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1782
SB	RT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	0.850	1.000	1515

SUPPLEMENTAL WORKSHEET FOR LEFT-TURN ADJUSTMENT FACTOR FLT

INPUT VARIABLES

DIR	C	G	N	Va	Vm	Vlt	Plt	No	Vo	Plto
NB	90	13	1	193	258	31	0.16	1	228	0.00

CALCULATIONS

DIR	Sop	Yo	Gu	Fs	Pl	Gq	Pt	Gf	El	Fm	Flt
NB	1800	0.127	2.357	0.733	0.161	11.091	0.839	6.487	1.536	0.816	0.816

CAPACITY ANALYSIS WORKSHEET

DIR	LN GROUP	v	s	v/s	g/C	c	v/c	CRITICAL
EB	LT	266	1693	0.16	0.18	299	0.89	*
EB	TH-RT	896	1753	0.51	0.57	1007	0.89	*
WB	LT	119	1693	0.07	0.18	299	0.40	
WB	TH	733	1782	0.41	0.57	1023	0.72	
WB	LT-TH	193	1455	0.13	0.15	217	0.89	*
WB	RT	96	1515	0.06	0.36	544	0.18	
SB	TH	228	1782	0.13	0.15	266	0.86	
SB	RT	349	1515	0.23	0.36	544	0.64	

CYCLE= 90.0 LOST= 9.0 SUM V/S CRIT= 0.80 TOTAL V/C= 0.89

LEVEL OF SERVICE WORKSHEET

DIR	LN GROUP	v/c	g/C	C	d1	c	d2	PF	Delay	LOS	Avg Q	95% Q
EB	LT	0.89	0.18	90.0	27.52	299	18.39	1.00	45.91	E	6.1	11
EB	TH-RT	0.89	0.57	90.0	12.67	1007	7.10	0.85	16.81	C	9.5	13
WB	LT	0.40	0.18	90.0	24.96	299	0.48	1.00	25.44	D	2.4	3
WB	TH	0.72	0.57	90.0	10.53	1023	1.70	0.85	10.40	B	7.8	8
WB	LT-TH	0.89	0.15	90.0	28.54	217	22.99	0.85	43.80	E	4.4	8
WB	RT	0.18	0.36	90.0	15.00	544	0.02	0.85	12.76	B	1.5	2
SB	TH	0.86	0.15	90.0	28.37	266	15.73	0.85	37.49	D	4.8	8
SB	RT	0.64	0.36	90.0	18.25	544	1.81	0.85	17.05	C	5.6	6

DIR	Delay	LOS
EB	23.46	C
WB	12.49	B
NB	33.53	D
SB	25.12	D

INTERSECTION DELAY = 21.56 INTERSECTION LOS=C

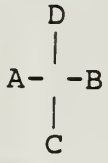
THE CYCLE LENGTH WITHIN THE BOUNDS OF 90 TO 90 SECONDS
WHICH MINIMIZES CRITICAL MOVEMENT DELAY IS 90.0 SECONDS

FOR A V/C RATIO OF .95 THE CYCLE SHOULD BE 57.2 SECONDS
THE EXISTING TIMING IS OPTIMAL

CINCH PROGRAM VERSION DATE 4-29-1988
1985 HCM - CHAPTER 10: UNSIGNALIZED - 4 APPROACHES (PAGE 1 OF 2)
DATE:10-11-1990 TIME:09:53:51
RTE 20 @ NOBSCOT - 2010 FULL BY-PASS

2010 PM Peak Hour
Pref. Build Alt. 2
Route 20/Nobscot Rd. Ex
with Full Bypass

LAST DATASETS LOADED OR SAVED
VOLUME= GEOMETRICS=
KEY:



GENERAL CHARACTERISTICS
POPULATION GREATER THAN 250,000: NO
CONTROLS: FROM C: STOP
FROM C RT LANE: STOP
FROM D: STOP
FROM D RT LANE: STOP
PREVAILING SPEED: 35 MPH
MAIN STREET # OF LANES: 4 LANES
MAIN STREET APPROACH A - EXCLUSIVE RIGHT TURN LANE: NO
MAIN STREET APPROACH B - EXCLUSIVE RIGHT TURN LANE: NO

MINOR STREET LANES

APPROACH: C: NOBSCOT
EXCLUSIVE LEFT TURN LANES: NO
EXCLUSIVE RIGHT TURN LANES: YES
LARGE RIGHT TURN RADIUS OR SHALLOW RIGHT TURN ANGLE: NO
RIGHT TURN ACCELERATION LANE ON MAJOR: NO

APPROACH: D: NOB EXT
EXCLUSIVE LEFT TURN LANES: NO
EXCLUSIVE RIGHT TURN LANES: YES
LARGE RIGHT TURN RADIUS OR SHALLOW RIGHT TURN ANGLE: NO
RIGHT TURN ACCELERATION LANE ON MAJOR: NO

SIGHT DISTANCE RESTRICTIONS (in seconds)

APPROACH	A: RTE 20 EB	B: RTE 20 WB	C: NOBSCOT	D: NOB EXT
LEFTS	0.00	0.00	0.00	0.00
THRUS	0.00	0.00	0.00	0.00
RIGHTS	0.00	0.00	0.00	0.00

APPROACH	A: RTE 20 EB			B: RTE 20 WB			C: NOBSCOT			D: NOB EXT		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
VOLUME	33	112	89	29	156	99	29	156	99	0	169	27
PHF	0.90			0.90			0.90			0.90		
ADJ VOLUME	37	124	99	32	173	110	32	173	110	0	188	30
PERCENT GRADE	0.00			0.00			0.00					
PASS CAR/HR	40			35			35	191	121	0	207	33

STEP 1 RIGHT TURNS FROM	C:NOBSCOT	D:NOB EXT
CONFLICTING FLOWS	112	142
CRITICAL GAPS	5.7	5.7
CAPACITY	947	915
CAPACITY USED	13%	4%
IMPEDANCE FACTOR	0.92	0.98

1985 HCM - CHAPTER 10: UNSIGNALIZED - 4 APPROACHES (PAGE 2 OF 2)
DATE:10-11-1990 TIME:09:53:51
RTE 20 @ NOBSCOT - 2010 FULL BY-PASS

STEP 2 LEFT TURNS FROM	B:RTE 20 WB	A:RTE 20 EB
CONFLICTING FLOWS	223	283
CRITICAL GAPS	5.6	5.6
CAPACITY	848	791
CAPACITY USED	4%	5%
IMPEDANCE FACTOR	0.98	0.97
ACTUAL CAPACITY	848	791

STEP 3 THRU MOVES FROM	C:NOBSCOT	D:NOB EXT
CONFLICTING FLOWS	526	521
CRITICAL GAPS	6.8	6.8
CAPACITY	436	440
CAPACITY USED	44%	47%
IMPEDANCE FACTOR	0.64	0.61
ACTUAL CAPACITY	415	419

STEP 4 LEFT TURNS FROM	C:NOBSCOT	D:NOB EXT
CONFLICTING FLOWS	744	804
CRITICAL GAPS	7.3	7.3
CAPACITY	270	244
ACTUAL CAPACITY	153	136

SUMMARY OF LEVEL OF SERVICE BY MOVEMENT

MOVEMENT	DEMAND	CAPACITY	RESERVE	LOS	AVG DEL(SEC)	AVG QUEUE
LT FROM A:	40	791	750	A	4.80	0.05
LT FROM B:	35	848	813	A	4.43	0.04
LT FROM C:	121	947	826	A	4.36	0.15
SHARED LT/TH FROM C:	226	327	101	D	35.57	2.23
LT FROM D:	33	915	882	A	4.08	0.04
SHARED LT/TH FROM D:	207	419	212	C	16.98	0.97

2010 PM Peak Hour
Rt. 20/Nobscot Rd. Ext.
with New Bypass

CINCH PROGRAM VERSION DATE 4-29-1988
1985 HCM - CHAPTER 9: SIGNALIZED - OPERATIONAL ANALYSIS
2010 Nobscot New By-pass
PM Peak Hour
date:07-18-1991 time:10:03:01
LAST DATA SET NAMES LOADED OR SAVED
VOLUME=nobnbyp GEOMETRICS=nobnbyp SIGNAL=nobsbyp
LOCATED IN CBD:n
VOLUME & GEOMETRICS

	VOLUMES			# OF LANES			LANE WIDTH			CROSS
DIR	LT	TH	RT	LT	TH	RT	LT	TH	RT	WALK
EB	177	456	0	1	1	0	12.0	12.0	0.0	0
WB	87	356	0	1	1	0	12.0	12.0	0.0	0
NB	0	167	74	0	1	1	0.0	12.0	12.0	0
SB	0	232	201	0	1	1	0.0	12.0	12.0	0

TRAFFIC & ROADWAY CONDITIONS

			ADJ PARK			PEDESTRIANS				ARR
DIR	GRADE	%HV	Y/N	MOVES	BUSES	PHF	CROSS	BUT	MIN TIME	TYPE
EB	0.0%	2.0%	N	0	0	.900	0	n	7.0	3
WB	0.0%	2.0%	N	0	0	.900	0	n	7.0	3
NB	0.0%	2.0%	N	0	0	.900	0	n	7.0	3
SB	0.0%	2.0%	N	0	0	.900	0	n	7.0	3

PHASINGS

	EASTBOUND				WESTBOUND				NORTHBOUND				SOUTHBOUND				GREEN	Y+R	PRE/ACT
	l	t	r	p	l	t	r	p	l	t	r	p	l	t	r	p			
1	*				*						*				*		17.3	3	A
2		*	*			*	*										42.2	3	A
3									*	*	*		*	*	*		21.5	3	A

CYCLE= 90.0

VOLUME ADJUSTMENT WORKSHEET
PART 1 (MOVEMENT ADJUSTMENTS)

DIR	LTV	THV	RTV	PHF	LTFR	THFR	RTFR
EB	177	456	0	.900	197	507	0
WB	87	356	0	.900	97	396	0
NB	0	167	74	.900	0	186	82
SB	0	232	201	.900	0	258	223

PART 2 (LANE GROUP ADJUSTMENTS)

DIR	LN GROUP	FLOW	N	LU	v	Plt	Prt
EB	LT	197	1	1.00	197	1.00	0.00
EB	TH	507	1	1.00	507	0.00	0.00
WB	LT	97	1	1.00	97	1.00	0.00
WB	TH	396	1	1.00	396	0.00	0.00
NB	TH	186	1	1.00	186	0.00	0.00
NB	RT	82	1	1.00	82	0.00	1.00
SB	TH	258	1	1.00	258	0.00	0.00
SB	RT	223	1	1.00	223	0.00	1.00

PART 3 (OPPOSING VOLUME ADJUSTMENTS)

LEFT TURN	OPPOSING APPROACH									
BEING OPPOSED	VOLUMES			% OPPOSING LEFT TURN			# LANES			OPPOSING
	LT	TH	RT	LT	TH	RT	LT	TH	RT	VOLUME
EASTBOUND	97	396	0	100	0	0	1	1	0	0
WESTBOUND	197	507	0	100	0	0	1	1	0	0

SATURATION FLOW ADJUSTMENT WORKSHEET

DIR	LN GROUP	IDEAL	N	Fwid	Fhv	Fgr	Fpark	Fbus	Farea	Frt	Flt	s
EB	LT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	0.950	1693
EB	TH	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1782
WB	LT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	0.950	1693
WB	TH	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1782
NB	TH	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1782
NB	RT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	0.850	1.000	1515
SB	TH	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1782
SB	RT	1800	1	1.000	0.990	1.000	1.000	1.000	1.000	0.850	1.000	1515

CAPACITY ANALYSIS WORKSHEET

DIR	LN GROUP	v	s	v/s	g/C	c	v/c	CRITICAL
EB	LT	197	1693	0.12	0.19	325	0.61	*
EB	TH	507	1782	0.28	0.47	837	0.61	*
WB	LT	97	1693	0.06	0.19	325	0.30	
WB	TH	396	1782	0.22	0.47	837	0.47	
NB	TH	186	1782	0.10	0.24	426	0.44	
NB	RT	82	1515	0.05	0.46	703	0.12	
SB	TH	258	1782	0.14	0.24	426	0.61	*
SB	RT	223	1515	0.15	0.46	703	0.32	

CYCLE= 90.0 LOST= 9.0 SUM V/S CRIT= 0.55 TOTAL V/C= 0.61

LEVEL OF SERVICE WORKSHEET

DIR	LN GROUP	v/c	g/C	C	d1	c	d2	PF	Delay	LOS	Avg Q	95% Q
EB	LT	0.61	0.19	90.0	25.28	325	2.30	1.00	27.57	D	4.0	
EB	TH	0.61	0.47	90.0	13.45	837	0.92	0.85	12.21	B	6.7	
WB	LT	0.30	0.19	90.0	23.69	325	0.16	1.00	23.85	C	2.0	
WB	TH	0.47	0.47	90.0	12.38	837	0.33	0.85	10.80	B	5.2	
NB	TH	0.44	0.24	90.0	22.12	426	0.47	0.85	19.20	C	3.5	
NB	RT	0.12	0.46	90.0	10.39	703	0.00	0.85	8.84	B	1.1	
SB	TH	0.61	0.24	90.0	23.17	426	1.77	0.85	21.20	C	4.9	
SB	RT	0.32	0.46	90.0	11.53	703	0.09	0.85	9.88	B	3.0	

DIR	Delay	LOS
EB	16.51	C
WB	13.36	B
NB	16.02	C
SB	15.94	C

INTERSECTION DELAY = 15.50 INTERSECTION LOS=C

THE CYCLE LENGTH WITHIN THE BOUNDS OF 90 TO 120 SECONDS
WHICH MINIMIZES CRITICAL MOVEMENT DELAY IS 90.0 SECONDS

FOR A V/C RATIO OF .95 THE CYCLE SHOULD BE 21.1 SECONDS
THE EXISTING TIMING IS OPTIMAL

CINCH PROGRAM VERSION DATE 4-29-1988
1985 HCM - CHAPTER 9: SIGNALIZED - OPERATIONAL ANALYSIS
2010 RT. 20 at New Bypass
PM Peak Hour
date:07-18-1991 time:10:31:54
LAST DATA SET NAMES LOADED OR SAVED
VOLUME=nobnbyp GEOMETRICS=nobnbyp SIGNAL=nobsbyp
LOCATED IN CBD:n
VOLUME & GEOMETRICS

	VOLUMES			# OF LANES			LANE WIDTH			CROSS
DIR	LT	TH	RT	LT	TH	RT	LT	TH	RT	WALK
EB	0	380	723	0	1	1	0.0	12.0	12.0	0
WB	0	506	0	1	1	0	12.0	12.0	0.0	0
NB	550	0	0	1	0	0	12.0	0.0	0.0	0
SB	0	0	0	0	0	0	0.0	0.0	0.0	0

TRAFFIC & ROADWAY CONDITIONS

			ADJ PARK			PEDESTRIANS				ARR
DIR	GRADE	%HV	Y/N	MOVES	BUSES	PHF	CROSS	BUT	MIN TIME	TYPE
EB	0.0%	2.0%	N	0	0	.900	0	n	7.0	3
WB	0.0%	2.0%	N	0	0	.900	0	n	7.0	3
NB	0.0%	2.0%	N	0	0	.900	0	n	7.0	3
SB	0.0%	0.0%	0	0	0	.000	0	n	7.0	0

PHASINGS

	EASTBOUND				WESTBOUND				NORTHBOUND				SOUTHBOUND				GREEN	Y+R	PRE/ACT
	l	t	r	p	l	t	r	p	l	t	r	p	l	t	r	p			
1		*	*		*	*													
2										*		*					50.0	3	A
																	34.0	3	A

CYCLE= 90.0

VOLUME ADJUSTMENT WORKSHEET
PART 1 (MOVEMENT ADJUSTMENTS)

DIR	LTV	THV	RTV	PHF	LTFR	THFR	RTFR
EB	0	380	723	.900	0	422	803
WB	0	506	0	.900	0	562	0
NB	550	0	0	.900	611	0	0
SB	0	0	0	.000	0	258	223

PART 2 (LANE GROUP ADJUSTMENTS)

DIR	LN GROUP	FLOW	N	LU	v	Plt	Prt
EB	TH	422	1	1.00	422	0.00	0.00
EB	RT	803	1	1.00	803	0.00	1.00
WB	TH	562	1	1.00	562	0.00	0.00
NB	LT	611	1	1.00	611	1.00	0.00

PART 3 (OPPOSING VOLUME ADJUSTMENTS)

LEFT TURN BEING OPPOSED	OPPOSING APPROACH VOLUMES			% OPPOSING LEFT TURN			# LANES			OPPOSING
	LT	TH	RT	LT	TH	RT	LT	TH	RT	VOLUME
NORTHBOUND	0	258	223	0	0	0	0	0	0	0

ATURATION FLOW ADJUSTMENT WORKSHEET

IR	LN	GROUP	IDEAL	N	Fwid	Fhv	Fgr	Fpark	Fbus	Farea	Frt	Flt	s
B	TH		1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1782
B	RT		1800	1	1.000	0.990	1.000	1.000	1.000	1.000	0.850	1.000	1515
B	TH		1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1782
B	LT		1800	1	1.000	0.990	1.000	1.000	1.000	1.000	1.000	0.950	1693

UPPLEMENTAL WORKSHEET FOR LEFT-TURN ADJUSTMENT FACTOR FLT

NPUT VARIABLES

IR	C	G	N	Va	Vm	Vlt	Plt	No	Vo	Plto

ALCULATIONS

IR	Sop	Yo	Gu	Fs	Pl	Gq	Pt	Gf	El	Fm	Flt

APACITY ANALYSIS WORKSHEET

IR	LN	GROUP	v	s	v/s	g/C	c	v/c	CRITICAL
B	TH		422	1782	0.24	0.56	990	0.43	
B	RT		803	1515	0.53	0.56	841	0.95	*
B	TH		562	1782	0.32	0.56	990	0.57	
B	LT		611	1693	0.36	0.38	640	0.95	*

YCLE= 90.0 LOST= 6.0 SUM V/S CRIT= 0.89 TOTAL V/C= 0.95

EVEL OF SERVICE WORKSHEET

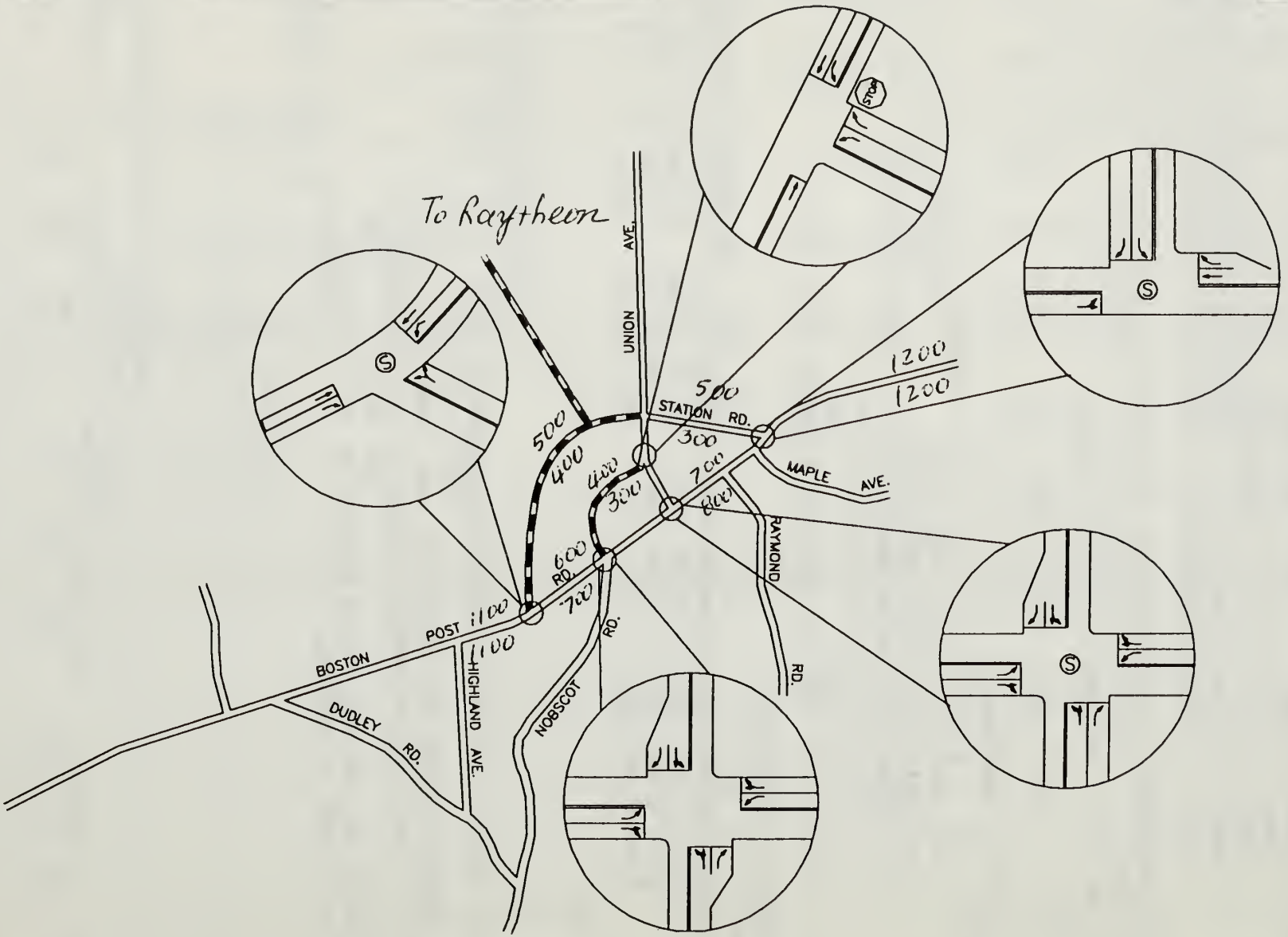
IR	LN	GROUP	v/c	g/C	C	d1	c	d2	PF	Delay	LOS	Avg Q	95% Q
B	TH		0.43	0.56	90.0	8.86	990	0.19	0.85	7.69	B	4.7	
B	RT		0.95	0.56	90.0	14.40	841	15.31	0.85	25.25	D	10.1	
B	TH		0.57	0.56	90.0	9.88	990	0.59	0.85	8.89	B	6.2	
B	LT		0.95	0.38	90.0	20.71	640	18.28	1.00	38.98	D	11.4	

IR	Delay	LOS
B	19.20	C
B	8.89	B
B	38.98	D

NTERSECTION DELAY = 21.82 INTERSECTION LOS=C

HE CYCLE LENGTH WITHIN THE BOUNDS OF 60 TO 120 SECONDS
HICH MINIMIZES CRITICAL MOVEMENT DELAY IS 90.0 SECONDS

OR A V/C RATIO OF .95 THE CYCLE SHOULD BE 97.0 SECONDS
HE EXISTING TIMING IS OPTIMAL



2010 PM Peak Hour Volumes
Sudbury Center with New Bypass

19. The raw 24-hour traffic counts performed by the MDPW for this study can be found in Appendix B. They are listed by town and show the exact date, location and direction counted.

    Descriptions of traffic diversion patterns can be found in the Alternatives Analysis and Conclusions sections of the report.

20. See response to comment #17 above and the Recommendations section of the report.

21. A "three-lane" Route 20 in Sudbury was not one of the selected alternatives for analysis and, therefore, is not part of this report's recommendations. Also, refer to response to comment #11 above.

22. Page 107 of the draft report referred to analysis of four intersections while analysis was done for seven (see Table 3-11.) The omission on page 107 has been corrected.

    The intersection Route 20/Wayside Inn/Hager Street, which is located in Marlborough, was analyzed, and it is included, along with the other Marlborough locations, in Table 3-12.

    The intersection Route 20/Peakham Road was not included in the study's scope of work (also, refer to response to comment #12).

23. Refer to response to comments #13 and #14.

24. Refer to response to comments #13 and #14.

25. The suggested corrections were made: see Appendix F.

26. Refer to comment response #8.

27. Correction was made.

28. Firstly, the Vollmer Associates MBTA study had not been scoped yet when the Route 20 study was well underway. Secondly, the structure of the scope of work for CTPS's study could not handle effectively the complicated alternatives considered by that study. But, more importantly, to the best of our knowledge the Vollmer options are not yet committed to by the appropriate state agencies. Therefore, the introduction of any of Vollmer's alternatives would introduce a degree of uncertainty into the recommendations of the Route 20 study.

    For all the above reasons it would not have been appropriate for CTPS to consider the Vollmer study options, even if they had been available in time for the analysis in this report. Instead, Weston should view this study as a basis to

assess any future traffic volume changes on Route 20 caused by the MBTA's or the MDPW's Route 128 projects (if any) .